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The Congress and the Profession.

The recent Congress on Tuberculosis is distinctly the most important gathering in which our profession has yet taken part, and the unexpected turn given to the discussions has made the paper by Professor M'Fadyean, which we print this week, one of the most prominent features of the transactions. Those who know how admirably accurate and careful his statements usually are will not be likely to undervalue either its facts or deductions. Looking at the present position of the matter one is reminded of the long controversy as to the identity of variola and vaccinia, and it seems not unlikely that the present differences will run an almost parallel course, though with some terms of the problem transposed—for it may yet be shown that tuberculosis in the human subject is but an "attenuation," and that bovines are the natural hosts of the parasite. With tuberculosis as with variola, the practical work—the prevention and arrest of disease can be carried on independently of the scientific investigation of its origin, and as one of the speakers said, it is not to be tolerated that some sections of the community shall be allowed to continue to sell to others articles of dietary which are literally loaded with disease-producing organisms.

But another, and a very satisfactory feature of the Congress was the increased part taken by the local Societies. Twelve months ago one came across, in the reports of meetings, the remarks of members who "didn't see the use of sending delegates." Such remarks have been conspicuously absent this year, and although it is unlikely that all who formerly disagreed have changed their opinions, we cannot but look on this year's result as showing a better understanding of the public duties of the profession.

South African Experiences.

Up to now, with the exception of one or two clinical notes, we have received practically nothing from South Africa, although a large number of our members are still there, and there must be much to be said—or written—which would be of general interest. Doubtless the constant movements, the great distances traversed, and the lack both of opportunity and conveniences counts for much; and many of us have a natural dislike for pen and ink which is fostered by such surroundings as exist there. This week we print two contributions which result from the war. Though neither is from S. Africa, both of them are valuable—directly as personal experiences, and indirectly as evidencing the wider knowledge required by the V.S. of to-day. Taken with the position of the profession at the Congress of last week, they form a fair commentary on the wisdom of the Council in maintaining the educational standard both general and professional.

TRAUMATIC PERICARDITIS.

Pericarditis is so familiar to all veterinary practitioners that I would consider myself only trespassing on your valuable space, did I attempt to give a detailed account of the symptoms, treatment, and usual termination of this affection of the heart and its covering. I simply wish to record a novel symptom which I observed in a cow a few days ago, and which I had not previously seen, viz, lameness of the near fore leg, amounting to almost dragging of the limb; in fact it looked exactly like a case of lameness of the point of the shoulder. I should say that the lameness did not proceed from any mechanical interference, such as swelling of the dew-lap, because no such swelling existed in this case. Of course the question naturally arise, Was the lameness due to the diseased condition of the heart, or was it the effect of an independent cause?

J. A. Thompson.

HORSES AT SEA.

By Geo. J. Harvey, M.R.C.V.S.

"Two horses dead in the night, sir," is a 5 a.m. report I receive, which causes me to leave my bunk quickly to hold an inquest on these animals and order their consignment to the deep. While thinking of my patients and their ailments it occurred to me that perhaps some notes of the trip might be of interest to other people, so I start my prentice hand on this article.

The war has necessitated a large number of horses being sent to South Africa, and they have been purchased all over the world. One consequence of this has been to make it my duty to take professional charge of the 727 shipped on ss. "Canning" of Liverpool. I joined her at Barry Docks, Cardiff, where she was coaling. First impressions of her, embellished by rain and coal dust, added to having to go aboard in the manner of our Darwinian ancestors, hands and feet on a nearly horizontal ladder, did not give me much pleasure. We sailed on the 10th May for Fiume, Austria, and here I may get in a few details as to the ship and her fittings.

The "Canning" is a large steamer which had already made two trips to the Cape with batteries. Length 450 feet, breadth 60 ft., and capable of carrying 7,000 tons weight of cargo. Every available portion of her was fitted with stalls except the lowest hold which had to be ballasted, where they *might* have carried 3,000 tons of Government stores, but other ships were engaged for that purpose.

The stalls, those on the upper deck being roofed, consisted of upright posts in parallel lines firmly bolted to deck and supports above, with loose plank partitions to drop into slots both for the sides and front, giving a room space for the horse of 8ft. by 2ft. 6in. Their heads pointing inwards and a passage way in front and behind them. The animals' heads were fastened by two head ropes, one on either side of the head collar to each upright post, with just sufficient play to let him get at his bucket to feed or drink.

It is needless to say that the animal would have to stand till his journey's end. On each deck, however, two stalls would be converted into one by removing partition plank to allow of a sick animal having more room for lying down. I found, however, that it was very exceptional for them when sick to lie down, preferring to stand till the last and then drop dead.

Where an animal got leg-weary strong canvas slings were used fastened to the overhead beams. The animals seemed to understand their use at once as they would drop into them by taking their fore or hind legs from the deck and give a very satisfied sigh of relief. Two days was the time allowed for this rest, and then the slings were taken away, otherwise the horses became too dependent on them, and besides the skin would chafe.

The feeds were given at six in the morning, twelve noon, and five at night. A galvanised iron bucket, flattened at one side, with two square iron hooks rivetted on flattened side, was used for watering and feeding. It could be slipped on to the breast rail right under the horse's nose. For hay tarred cord nets, similar to the Italian onion nets, were filled and hung on every alternate post on a level with horse's head, and answered well.

The buckets did not answer well. Horses are intelligent, and to appreciate the same one has only to be with them often and any unbeliever would be converted. There was never any need to consult the ship's clock; if you heard the horses getting restless, whining and pawing the deck, though no attendant was in sight or bucket sounding, you might be sure that it was five or ten minutes to their feeding hour. First the bucket would be filled with water. Having slacked their thirst they would take the farthest rim of the bucket and throw it on the deck and seem to look round for applause. The maledictions of the attendants had no effect on them, or perhaps they took it as applause.

The buckets having had their supply of bran and oats put in are replaced, and silence will reign until they have finished when "bang" go their buckets on the deck—they call for the third course, hay. Some horses feed quicker than others, and the unlucky slow feeder will sometimes lose half his meal by his quicker neighbour "commandeering" the remainder. I have seen horses whose head ropes were not sufficiently short lean over, take their neighbour's bucket in their teeth, drag it along the rail and finish it for them, and then toss it on the deck. Now rivets and galvanized iron will not stand this treatment, the hooks break off, and soon there is a scarcity of buckets. They should be made in sets of four or six and iron bound, and then I doubt if the intelligent animals could act in sufficient union to get rid of them.

After their meals, like we poor mortals, they do not seem to care if it snows or any other calamity comes on them. The majority rest their heads on the front rail and go to sleep.

It is wonderful how soon they get their sea legs. We had a very good passage as far as weather was concerned, yet there is always some sea to disturb the equilibrium of the ship. The rythmic swing of a line of 40 horses' heads as the roll is on, appearing as the roll is towards them and disappearing as it recedes, is very comical.

In our case the Government chartered the ship to carry the horses from Fiume to Cape Town at a price, leaving all details to owners of ship. These details included fittings, feeding, and attendants. The fittings previously described were the original Government fittings for the batteries to the number of about 300. The remainder were put in by the contractors. Their fault was that too much wood was used; they were boarded all round, the divisional partitions being in four pieces and the front breast block being bolted in six sections, so that if a horse got down in the middle the others had to be moved before he could be got out. This the Captain and officers of the ship remedied as much as possible before arrival at Fiume. The food was good with some small exceptions. Having a large surplus of forage the exceptions followed the dead horses, overboard.

The attendants, advertised for in the daily paper a week previous to the start, were a nondescript lot with but two or three practical horsemen among them. On inquiry their late trades, professions, or occupations had been Baronet, Barber, Ship's Smith, Chucker-out or hotel expeller—looking however more as if he had been the expelled than expeller, Coal merchant, Carpenter, Reporter—not seeking copy for the fun of it; and Ship's steward. There were 35 attendants and three foremen, one of whom would classify every male specimen in the equine line as a colt. The men received £10 a head for the trip and the foremen £30, and all found for both. It is only due to them to say that they did their best, both to take care of their charges and earn their gratuity. They were on the ship's articles and under the sole control of the Captain.

I think that soldiers from the mounted divisions of our Army should have been sent to take charge of valuable Government property, every horse costing on landing over £50. A military representative from the Remount Department was on board. Our voyage was free from all clashing, due to the above arrangements, but it should point a moral to certain officials in high places. The ship previous to ours, fitted at Fiume, and took all foreigners as horse tenders, *no wages*, and only three or four knew English. Bear this in mind when I tell you that Austria is pro-Boer, and the English uniform frequently hissed. To return to our "passengers." All that could be done for their care and comfort was done and night guards arranged for, who were to inspect every hour and report then to officer of the watch.

Some time after leaving Barry, four stowaways appeared on deck. They were not welcomed, but continued with us, and earned their keep.

The voyage to Fiume was uneventful. Favorable weather, land nearly all the way from Portugal—we keeping along the African coast, and then crossing to Sicily and up the Adriatic; the Mediterranean putting on her bluest of blue gowns gave us a pleasurable trip. Fiume was reached on the 20th, before our time, we not being expected till the 24th, and we had to wait till then, for the horses to be brought down country from Szabadka, beyond Buda-Pesth. When I received my marching orders I made enquiries as to Fiume, but could get no information, except that it was somewhere up the Adriatic, and noted for nothing. It is the only port of Hungary, and an important commercial town, extending a mile along the sea face and bordered by quays, with heavily wooded hills in the back-ground, up which the town creeps, so to say, thinning out with suburban villas. The bay or gulf in which it lies is only ten miles square and looks like an inland sea, the exit not being visible from Fiume. The two places of interest to be seen were Whitehead's Torpedo Works, and Abbazia, the fashionable watering place across the bay. Not being the Duke of Orleans I was allowed to look over the torpedo works, and see the trials. Now I have a horror of snakes and mythical sea-serpents, the former acquired in a previous visit to South Africa,and the latter on the voyage there. Standing in the trial shed and looking down into the water watching these seeming sharks, gave me the feeling that what I was standing on was not strong enough. I moved. I was told that their movement in the water cannot be observed when approaching you. I took that for granted and preferred the view from the back.

The town is well laid out, streets asphalted, electric trams with overhead wires; houses of four or five storeys. The population is some 35,000, and I did not at first understand where they all lived. No terraces, semi-detatched or detatched villas were to be seen, as is the case in England. It is a system of flats or *pensions* over business premises, and extends to the suburbs. A day porter is always in attendance who locks up the outside door at 10 p.m. The town swarms with soldiers, or at least they all look like soldiers, every body wearing a uniform. The real article, I found, was to be distinguished by tight trousers, which finished below *inside* his boots, and reminded me very forcibly of an article of gentlemen's underwear. The commercial population are commercial, and I was informed that Jews were not liked there. I have known several Jews in my time, and I would respectfully advise them not to go to Fiume, as they could never make a living in any capacity. It would be Greek meeting Greek, with odds on the Fiumite. If wishing to make a purchase, you will be escorted to the different places and purchase it by your guide's advice; when leaving the shop your guide—dallies, is a pretty word—receives his commission, and rejoins you. On advice. I adopted the Yorkshire horsedealer's motto "Ask hafe und I'll bid ther," and it succeeded.

Nobility in Fiume is well represented by counts and barons and their female prototypes, but all poor and proud. Several distinguished members came on board to see how the British Government carried their horses. They partook of tea, which is a very great luxury, being a Government monopoly, and very expensive therefore.

The *élite* of Fiume do not treat each other with a generous hand in the matter of "junketings," and the Governor, who is a very generous man, is the principal provider on festive occasions. Unless a dinner is attached, the invitations are eyed very critically. I was informed that at a recent dinner the guests sat down at 9 p.m. and sat and ate till 4 a.m. This as a gastronomic performance is distinctly good, but it passes the bounds of credibility, that after, some of the guests purloined delicacies; and one gentleman was observed walking out with two decorative feathers sticking out of his tail coat pockets in evening dress, which were even then attached to a cooked pheasant.

Old Fiume may be considered picturesque, as I am told it is by artists, for its Romeo and Juliet balconies and narrow streets, but I should not consider it healthy. The modern portion is well laid out, with up-to-date improvements. The hotels and cafés conduct their business inside and outside as in Paris and Brussels, and it was pleasant to sit out on an evening at a small table on the pavement, taking your coffee and having a genuine Hungarian band to soothe any ruffled feelings.

In mentioning monopolies just now I omitted salt and tobacco, which are very strictly guarded. On arrival at the quay, the Customs officers came on board to seal up dutiable articles. This is done, even, to what you may have on you. Our chief engineer had not thought about two loose cigars and his tobacco pouch lying in his cabin, which an inquisitive Custom House officer spotted, and it was only by the careful administration of smooth words and intoxicants that a fine was not inflicted. Evidently free trade is not wanted here by Government, and no chance is lost of taxing, directly or indirectly.

Certainly the largest industry is Whitehead's torpedo factory, and Fiume would miss it. His public spirit and private charities are known far and wide. In one instance, as all sailors will know, he bought and furnished a freehold property for a Sailor's Home, and no Englishman would ever be in Fiume without visiting Mr. Hughes, the manager, and his wife. It is a very perfect and comfortable club, and, Mr. Hughes informed me, nearly self-supporting now. He visits every ship that comes in, and provides newspapers which arrive from England daily. In this way we learned that the relief of Mafeking had taken place two days previous to our arrival.

The Queen's birthday was celebrated in loyal style, but processions were discountenanced, as the inhabitants are pro-Boer, and hiss the British uniform.

The appearance of the horses I waited for with some curiosity as I had seen nearly all other types. The trucks arrived on the 24th and the animals unloaded. Their two days in the trucks did not cause them to look bright but they are decidedly a good type, so good indeed that Lord Roberts hearing of

their qualities on their landing, had them all forwarded at once to Bloemfontein. It was a simple matter to ship them, as gangways had been built from the quay to the ship, and all being wonderfully docile they followed each other up and into the stalls like sheep. Out of 727 there were 74 sick when shipped. This should not have been, but they were sent on board. The actual time taken in getting the horses on board and stabled was 6½ hours. When watered and fed they settled very quietly in their new quarters.

Just as the first horse was coming on board one of the attendants observed a man's head bobbing in the water between the quay and ship's side. He without thinking jumped down some fifteen feet to save the individual but being unable to swim the saver had to be saved first. The man in the water had been there some days it turned out on enquiry, he having been missed, and being half-witted it was supposed he had fallen in the river. He was left in the water till the City Fathers had assembled and held the inquest on the spot.

We left Fiume with no regrets and faced about for our voyage to Table Bay in heavy rain and strong cold wind. This started our death roll, as one of the sick animals on the main deck died after being three days out. The two days travelling on the rail from Szabadka had a lot to do with weakening the horses. His funeral took place at once, a piece of lashing as a necklace and attached to the winch rope caused him to rise and swing out over the side, then the lashing was cut. We ran into a thick fog at Gib. and had to stop and blow the fog horn. Being at night this drove the horses frantic, and six jumped clean out of their stalls over the breast piece. This was four feet from the ground and the space through which the animals jumped was 3 ft. by 2 ft8 in. For a standing jump this is good. They were captured and quietened, and fortunately the fog cleared.

310 cases of sickness occurred on the voyage, and 44 died. Pneumonia in a septic form was the principle cause, apoplexy and accidents being responsible for the rest. When it is known that a horse takes sixteen times the dose a human being requires, it will be understood that the administration of medicines was no easy task, as horses do not take their doses voluntarily.

On reaching Cape Town we received orders to go round to Port Elizabeth and discharge them there. There being no dock or wharf, lighters had to be fetched off, each being capable of holding 50 horses, and a gang of Kaffirs set to work to unload our animals. Three derricks worked at the same time on three lighters. A strong sling of webbing with a loop of rope at each end was placed round the horse's middle, one loop passed through the other and hooked on to the wire winch-rope, and up the animal would go, kicking and screaming but perfectly helpless, swing out over the side and down into the lighter. The winch rope being unhooked the slings would drop off the animal and it would be free to go where it willed—inside the lighter. When full the lighter was towed to the jetty, and they were landed in a similar manner ; soldiers would then march them off to the remount depôt in squads of four.

Without taking undue praise to ourselves, our lot were landed in splendid condition and were the topic of conversation—in spite of the 18,000 which had been landed previously. So well were they appreciated at the Depôt that after the last was landed I visited the depôt and found some of them being trucked off to Bloemfontein to the front, although they were entitled to five days rest.

To thorougly understand the noble animal I would advise a trip with a shipload of them. They have one little foible, which the human race are also afflicted with. After a voyage spent in each other's company and no amusement they get heartily sick of that company and show it in their tempers.

British Congress on Tuberculosis.

On Tuesday, 23rd ult., the Veterinary Section was opened by Sir George Brown, C.B., who presided throughout the Congress. The first paper read was by Prof. Dewar, and the following is an abstract.

THE DIAGNOSIS OF TUBERCULOSIS IN ANIMALS DURING LIFE.

As our subject is not semiology but diagnosis, it will be unnecessary to dwell on the primary symptoms of the disease. It is not uncommon for its first appearance to be indicated by a rough harsh sound in the throat during respiration, especially in young animals, and heard best when the head is lowered in feeding. There may be nothing else. Possibly on manipulation an enlargement may be made out in the upper parotid region. The history will assist—the prevalence of tuberculosis in the herd, or of actinomycosis in the district. When a tumour begins to project externally in the same region it can generally be distinguished from actinomycosis. The tubercular tumour becomes adherent to the skin over a single central area as a rule. As often the actinomycotic tumour forms more than one point of adhesion, and subsequently of softening. If enlarged lymphatic glands can be made out about the root of the neck or elsewhere diagnosis is practically confirmed, while with actinomycosis the jaws, tongue, or lips are more frequently involved.

But as in about 75 per cent. of cases of tuberculosis the thoracic organs are early affected, it becomes a question of diagnosing the disease within the chest.

If in a cow, and it is often in a cow, she may be observed to give an occasional cough without anything very characteristic about it. It can often be induced by turning her out of the warm byre into the colder atmosphere outside, or by any excitement or disturbance, but her health is not affected and the owner thinks nothing of it.

By-and-by, although feeding all right and giving an ordinary amount of milk she begins to lose condition, the hair becomes dry, and if in the byre she may be found sweating over the shoulders in the mornings. Very often a peculiar facial expression, the outward and visible indication of the tubercular diathesis, becomes apparent to the experienced observer. Before emaciation is at all pronounced the skin becomes firmer, it is less soft, supple, and movable, and more adherent to the subcutaneous tissues. Pinching over the back or loins may cause the animal to cringe, and in the intercostal spaces may be manifestly painful. The cough becomes more frequent, more spasmodic, occurring in fits, and is sometimes evidently painful.

On percussion there may be little to distinguish them,—in bronchitis there may be no perceptible alteration on percussion, and if accompanied by pulmonary emphysema the resonance may even be increased. But there may be no diminished resonance in pulmonary tuberculosis where miliary tubercles are scattered throughout the lungs, at least in the upper part of the chest the resonance may even be increased, although it is often somewhat diminished; there is some perceptible dulness towards the lower and anterior parts of the chest.

On auscultation the vesicular murmur is heard louder and harsher than normal over the upper half of the chest. Towards the lower borders of the lungs it becomes weaker, and may be almost imperceptible towards the middle and anterior regions of the chest, or bronchial sounds may completely disguise it. There may be nothing heard but sibilant râles and sonorous rhonchi which become displaced, or altered on coughing. There can also be observed—what can also be seen while standing watching the animal breathing—a difference in the relative length of the inspiration and expiration. The expiration is prolonged, longer than the inspiration. If there is perfect quietness this can be clearly made out on auscultation. The vesicular murmur is distinctly heard during expiration, and as distinct during the end of the expiratory act as at the beginning. This never occurs in health, nor am I aware that it occurs in any other disease.

But tuberculosis frequently affects other organs as well as the lungs, and our older clinical methods are often unequal to the formation of a definite diagnosis. The most important of these other organs from a public health point of view is undoubtedly the mammary glands. Increased experience leads me to believe that the number of tuberculous cows affected with tubercle of the udder is greater than that usually estimated, *i.e*, about 3 per cent. Apart from cows that are only recognised as tuberculous through the action of tuberculin, I think the percentage would be from five to seven.

In the udder the progress of the disease is often slow, and there is no doubt but it may exist for weeks in such a condition as to render the milk dangerous before the most expert clinician could detect its presence. The posterior quarters, one or both, are most frequently affected, and although sometimes acute it is seldom distinctly painful. As a rule the swelling is more or less diffuse, not often nodulated, and the physical characters of the milk are at first very little changed, less so than with a non-specific inflammation or "weed." On the other hand one quarter of the udder or more may become rapidly enlarged, hard, brawny, although but little painful, and it should not be mistaken for a simple inflammatory induration.

Bacteriological Diagnosis.

This brings us to bacteriological diagnosis which is of most general use in the examination of milk, a subject which I cannot enlarge on at this time.

It can also be applied to discharges from the nose, to matter coughed up, or scraped or sponged off the pharynx while the tongue is secured after causing the animal to cough, to the pus from the suppurating tumours, from cold abscesses, to any suspected discharge from the vulva, and to particles of tissue abstracted from an enlarged mammary gland, lymphatic gland, or even tumour, by the pathological harpoon. The demonstration of the tubercle bacillus under the microscope is distinct evidence of the presence of the disease.

Of importance is the agglutinating power of tuberculous serums, or even tuberculous effusions. As early as 1898 attention was directed to this method by M. Arloing, Director of the Veterinary School of Lyons. He seems to consider the method of great importance in diagnosing tuberculosis in the early stages in the human subject.

Experimenting on cattle he found that the blood serum of healthy adult cattle had an agglutinating power on tubercle bacilli in a "bouillon" culture, but that the power was only feeble, whereas the agglutinating power of the serum of tuberculous cattle was much more powerful; and he states in this manner the presence or otherwise of tuberculosis in the animal from which the serum is obtained can be determined. He claims that this method of diagnosis is calculated to be of great usefulness in cases where fraudulent means have been used in order to prevent the usual reaction from tuberculin. This failure to react to the tuberculin test may be brought about by repeated injections of tuberculin, and probably by other means. The agglutination method might therefore prove of great value to portal veterinary inspectors and those interested with preventing the importation of diseased animals.

At the same time it is not a method which can be readily applied by many practising veterinary surgeons. It requires a considerable familiarity with bacteriological methods, with laboratory technique. It is necessary to have a culture of the tubercle bacilli in which the organisms are uniformly distributed throughout the culture media so that it has a homogeneous appearance from top to bottom. M. Arloing states that to a little of this culture in a small test tube a few drops of blood serum from the animal to be tested are added, shaken together, and the tube left upright. He adds that agglutination commences almost at once, that it become visible to the naked eye in five or six hours, and is complete in 24 hours. The agglutination is characterised by a turbidity in the tubes, the bacilli forming into small clots which soon sink to the bottom of the tubes, leaving an absolutely transparent liquid above, if the agglutination has been complete. The amount of serum required to cause complete agglutination of the bacilli is used to estimate the agglutinative power Thus if fifteen drops of serum are required to cause complete agglutination in sixty drops of the culture, he says that the serum has an agglutinative power of one in five. He states that this is practically the agglutinative power of the blood serum in healthy adult cattle, while that of calves under two months old is not over one in two, and that of tuberculous cattle is as high as one in ten and even more. Consequently, according to M. Arloing, an animal the blood serum of which has an agglutinative power of one in ten and over, should be considered tuberculous.

The introduction of tuberculin gave us the most efficient, reliable, and practical means we yet possess of diagnosing tuberculosis. At first hailed as a beneficent agent in curing the disease in the human subject, it was soon found that the too sanguine hopes entertained regarding its curative properties—whatever future experience may yet prove these to be—were doomed to disappointment, and it is to-day recognised as being of more value to the veterinary surgeon as a diagnostic agent than for any other purpose.

Notwithstanding the many attempts to discredit its diagnostic value, and expressions of scepticism when reactions were very numerous; notwithstanding the cases—numerous cases, shall I say?—of reputed failures, published and made much of, mostly in agricultural journals—how seldom it is that any complaint of failure in its action is seen in a scientific journal!—notwithstanding the extent to which it has been decried, it is by a long way the most reliable, the most practicable, and the most uniformly useful means of diagnosing nascent or latent tuberculosis that we possess. In fact, we have no other of any practical value, for those methods we have already considered, whatever value they may be found to possess, are as yet scarcely out of the experimenting stage. For the full and successful use of tuberculin as a diagnostic agent, several things are required:—

1. A thoroughly reliable tuberculin. There is no doubt but there are tuberculins *and* tuberculins, and as

tuberculin can have no definite and unalterable chemical composition there is no security for its quality but in having it properly prepared by a competent pathologist or pathological chemist, and carefully tested before being sent out for general use. Then, whether it is in the form of a powder or a solution, whether concentrated or diluted, it ought to be thoroughly reliable in certain stated doses as a test for tuberculosis.

2. That the herd to be tested should be kept quiet and undisturbed, without any pronounced change in food, in pasturage, in surroundings, in management of any kind for ten to fifteen days prior to the application of the test. The recurrence of the usual genesic phenomena renders the female, for the time, less fit to undergo the test. And if at large in a field amongst others, she may disturb the result of the test in a considerable number of animals. In our more northern latitudes we have some advantage in the application of the test over those situated farther south. When animals are tied up for the winter there is almost an ideal condition for the application of the test. It is much to be preferred to doing it while they are out at pasture. The length of the winter also enables the test to be applied to a herd twice a year while housed, at practically six months' interval.

3. That the veterinary surgeon be allowed perfect freedom and every facility in the application of the test. With plenty of willing and intelligent assistants there should be very few mistakes, very few doubtful reactions. There is no doubt that a very prevalent thoughtlessness on the part of owners of stock in disarranging animals or in carelessly introducing some disturbing element is frequently the cause of doubtful results which would otherwise be distinct and reliable.

The test being finished, a proper reading and proper understanding of the temperature chart is necessary to a correct allocation of the animals. A normal reaction in a tuberculous animal begins about the ninth or tenth hour, attains its maximum from about the thirteenth to the seventeenth hour, and again gradually falls. Any sharp sudden rise in temperature with sudden fall, or any drop and subsequent rise during reaction, should be looked on with suspicion. Also any delayed and sudden rise, although I have seen an early sharp rise in very tuberculous animals and the rise delayed in old animals but slightly affected, still, cases would require to be multiplied before these could be considered of diagnostic significance. Then what rise of temperature should be considered as diagnostic of tuberculosis? First let me deprecate the fixing of any definite temperature, the rising above which should be considered sufficient to condemn the animal. This has been done in printed instructions sent out with tuberculin. The reaction should only be considered as the extent of the rise above the normal temperature, and that should be ascertained by taking it repeatedly, finding it practically steady, and taking the mean. A variation of 1½°F. will often be found in animals in perfect health, and while 101° may be normal in one animal, it may be 102½° in another.

When I first commenced to use tuberculin any animal giving a reaction of 2½°F. or over was condemned, any one in which the reaction was not over 1½° was considered healthy, while those in the intermediate zone were classed as doubtful.

Now although nineteen out of every twenty tuberculous animals will give a reaction of over 2½°F. under favourable circumstances with reliable tuberculin; and in nineteen out of every twenty healthy animals the temperature will not rise over 1½°F., yet increased experience leads me to believe that most of those animals giving a reaction of over 2°F. and formerly classed as doubtful, ought to be considered tuberculous.

Another thing which tends to cast discredit on the tuberculin test is the attempts that are made, sometimes countenanced in high places, to test animals on the cheap The temperatures are never taken until the tuberculin is about to be injected, and only at the 12th, 15th, and 18th hours, and the investigator goes away with his chart satisfied that he has done his duty. In all cases it ought to be taken at the 9th hour and on to the 18th. In some cases useful evidence may be obtained an hour or two later. Then as the taking of the temperatures even every three hours usually requires the continuous attendance of an assistant, they should be taken every two hours unless the herd is a very large one where a host of assistants would be required.

When every precaution is taken and the test carefully applied, at least 98 per cent. of the results will be correct and definite. It is almost as was stated in the summing up of a report by the Veterinary Inspector to the Board of Public Health of Victoria two years ago. After test-297 dairy cows he said: "When tuberculin indicated that tuberculosis was present, tuberculosis was found; and when tuberculin indicated that tuberculosis was not present, tuberculosis was not found." None of our methods are so perfect but that they are capable of improvement.

The conclusions arrived at by Prof. E. N. NOCARD, of Alfort, who followed Prof. Dewar, were that tuberculosis was one of the diseases of cattle which caused most loss to agriculture in all countries. Everywhere, he affirmed, the disease was on the increase; everywhere it formed a menacing danger to public health as well as to public wealth. Infection being the only formidable cause of the increase of tuberculosis, he thought there was need for the adoption of legal measures prescribing:—

(1) The complete separation of unhealthy from healthy animals.
(2) The slaughtering, without delay, of those sick animals which showed clinical signs of the disease, and especially of cows attacked with tubercular mastitis.
3) The interdiction from selling other tuberculous animals for a destination other than the slaughter-house.
(4) The pasteurization of all the sub-products used in butter and cheese manufactories.

Prof. BANG, of Denmark, said it was well known that he recommended the test very warmly, and that it had been used in Denmark for many years. On the whole he agreed with the opinions expressed by Professor Dewar and Professor Nocard, and he was glad to see that Professor Dewar advocated the taking of the temperatures after injection. He had seen many examples which proved it was too late to begin to take temperatures 12 hours afterwards. The great advantage of tuberculin was that it enabled a veterinary surgeon who had suspicions of tuberculosis in an animal to verify them.

Prof. MALM, Director of the Veterinary Service of Christiania, placed before the Congress a long and important paper, of which the following is a summary:—

(1) The tuberculin employed for diagnosis should be a tuberculin produced on the same principles as that of Koch in 1890. Its strength should be uniform, and it should be of such toxical strength as to kill with certainty six to eight weeks' old tuberculous guinea-pigs within eight hours in doses of 20 to 30 centigrammes subcutaneously.

(2) Such a tuberculin produced unfailingly in tuberculous animals a febrile reaction of a distinct type. He recommended that large doses should be given even to young animals, and there was no danger or inconvenience in always employing doses of a half to one gramme.

(3) Tuberculin might at times also produce fever in non-tuberculous animals, but this fever was not typical,

and did not attain such a degree as in tuberculous cases.

(4) If a typical tuberculous reaction appeared in an apparently healthy animal, and, on dissection, nothing tubercular was found, it was the fault of the dissector.

(5) To determine with certainty whether reaction existed or not, it was necessary to take the temperature hourly from the 6th to the 20th hour after injecting, or at least every second hour

Mr. WILLIAM REED (London Central Meat Market) asked whether it would be possible, even for a Professor, to detect tuberculosis in an animal before emaciation had set in, by simply looking at it in the yard, the field, or the market?

Prof. SCHUTZ, of Berlin, who spoke in German, considered it would be possible to make a diagnosis of tuberculosis of the udder by examination of the milk.

Dr. BANG, however, maintained that it was not possible.

Prof. M'FADYEAN was not sure that Professor Dewar's paper was not calculated to give an impression that the possibility of diagnosis without resort to tuberculin or bacteriological examination was greater than it really was. If a veterinary surgeon was called upon to diagnose tuberculosis only under the circumstances in which the human physician was asked to make a diagnosis, in a large proportion of cases a very probable diagnosis could be made, and in a considerable number a certain diagnosis; but it ought to be recognised that to deal successfully with tuberculosis it was necessary to make an early diagnosis, and there was no other method than the tuberculin test, by which only it was possible in 80 per cent. of the cases of tuberculosis in existence at any given moment to arrive at any conclusion at all. He did not think there was any justification for saying that every animal which was the subject of tuberculosis gave a distinct reaction when tested, and he believed it was a practical mistake to exaggerate the value of tuberculin; still it had to be admitted it was far the best method of diagnosis at present possessed.

Prof. W. OWEN WILLIAMS pointed out that it was not only the ox tribe from which the human being had to fear danger, but other animals, such as the horse, dog, cat, and bird, were capable of conveying the disease to the human being. He emphasised the importance of taking the temperature of the animals night and morning, as when subjected to the tuberculin test animals showed continuous variations in temperature at such periods of the day.

Mr. POTTIE, of Paisley, having expressed an opinion not at all flattering to the use of tuberculin;

Prof. W. A. EDGAR said it was now the great business of veterinary surgeons to say both to the Government and to the British public that they were able by the use of tuberculin to diagnose the disease. His convictions were as strong as those of Professor Dewar as to the accuracy and value of tuberculin, provided the element of error was carefully taken into account. People required their herds to be tested cheaply and this imparted an element of error into the question. Where tuberculin was bought and used by other than scientific men error was bound to creep into the results.

Prof. ARLOING, of Lyons, presented a long paper written in French, in which he said that since 1898 he had been trying to discover the existence of tuberculosis in man and in animals by agglutination effected by the serum of suspected subjects and a homogeneous culture of Koch's bacillus in a glycerinated broth, carefully selected for the purpose. Applied to animals of the bovine species the observations, carried out on more than 150 subjects, had demonstrated:—

(1) That the blood serum of calves from five to eight weeks old did not agglutinate those cultures and did not clear them when in the strength of 50 per cent. (*i.e.*, 50 per cent. serum).

(2) That the serum of Healthy adults agglutinated and very often cleared, when of 20 per cent. strength, but never completely when of 10 per cent. strength.

(3) That the serum of tuberculous adults, with rather rare exceptions, agglutinated and cleared completely when between 10 per cent. and five per cent., and sometimes even when weaker than that, so that every suspected animal which cleared with 10 per cent. serum, a culture that would be imperfectly cleared with 20 per cent. serum from a healthy animal might be considered as affected by tuberculosis.

(4) A diagnostic injection of tuberculin did not perceptibly modify the agglutinating power of healthy cattle.

(5) Serum-agglutination was therefore a new method of diagnosing tuberculosis in oxen which could be realised under any conditions *ad hoc*, especially in cases where recourse could not be had to the use of tuberculin.

Prof. MCEACHRAN, of Montreal, said that in his experience, which was somewhat extensive, the tuberculin test could be relied on in Canada almost exclusively. When it was found that foreign countries and the colonies had taken up tuberculin and were determined that no cattle should be introduced into their countries without having been tested the subject was given an important commercial aspect, and unless the breeders of thoroughbred stock in England adopted the test the probability was they would lose a very valuable market.

Mr. SYDNEY VILLAR considered that the use of tuberculin was of the utmost value to Agriculturists and of the very greatest value to the exporters of cattle and to colonial and foreign buyers, because by simply injecting a young animal a certain knowledge was obtained as to whether the abnormal sound in the throat referred to by Professor Dewar was due to tuberculosis or simply to a deformity.

Mr. LAITHWOOD, Chief Veterinary Inspector of the County of Cheshire, said that in the majority of cases he had been unable, without the help of tuberculin, to diagnose tuberculosis. After testing over 4000 animals, chiefly dairy cattle, in the county of Cheshire and neighbouring counties, he had found very few mistakes to occur, and where the animals had been slaughtered the test was corroborated in 98 per cent of cases. It was well known that the reactions occurred at different periods in different animals, and he had found that about 3 per cent. of reactions would have the highest degree of temperature at the 10th hour after injection, that 80 would attain the highest from the 12th to the 14th hour, 12½ per cent. would rise to the highest point from the 14th to the 16th hour, and 3½ per cent. from the 16th to the 20th. He was firmly of the belief that there was no element of such immense value in the diagnosis of tuberculosis than thoroughly reliable tuberculin, properly injected, and with the temperatures carefully taken from the 9th to the 20th hour.

Mr. T. EATON JONES said that in Liverpool every confidence was reposed in tuberculin, and its use, he believed, did not in any way depreciate the value of the animal.

Mr. J. S. LLOYD, of the Health Committee of Sheffield County Council, spoke on tuberculosis of the udder, pointing out how difficult it was to diagnose this disease at an early stage.

Mr. C. E. PEARSON, of the National Federation of Meat Traders', in the course of his remarks, said that butchers did not consider tuberculin to be a completely reliable agent, for sometimes animals had been tested and had reacted, and after all had been found to be non-tuberculous.

Mr. W. FIELD, M.P., said the question he wanted Professor Dewar to answer was, whether it was possible by inspection to diagnose and certify the disease of tuberculosis in the living animal without having recourse to the tuberculin test, and the question was a very im-

portant one to the meat trade, because the carcase of an animal which a butcher had purchased at full value in the open market might afterwards be confiscated and no compensation made. In his opinion the trade was being thrown into the hands of the foreigners.

Prof. DEWAR then replied to the various questions which had been put to him during the meeting. He said it had never been claimed for tuberculin that it would preserve an animal from tuberculosis. An animal was just as likely to have the disease after being tested as it was before. Of course, there was always a short incubative period, and if when the animal was tested it was non-tuberculous, it would certainly be some weeks before it would react to the test again, and during that period it might be supposed to be perfectly healthy. Replying to Mr. Reed's question, he could only say that veterinary professors were no more infallible than other men in their diagnosis; and he should say that it was impossible for anyone, by simply looking at cattle, to say whether they were tuberculous or not; they might have their suspicions, and might impart them to their clients. Neither did he claim that the tuberculin test was an infallible one, but only as nearly infallible as any they had yet obtained or were likely to obtain. He thought it would be a very good thing if the Government would become responsible for the tuberculin, and also for its distribution in scientific hands.

TUBERCLE BACILLI IN COWS' MILK AS A POSSIBLE SOURCE OF TUBERCULOUS DISEASE IN MAN.

By Prof. JOHN M'FADYEAN, M.B., M.R.C.V.S.

[At Queen's Hall on Thursday, July 25.]

As recently as a few days ago, when I was mentally arranging the material for the paper which I have now the great honour of submitting to this Congress, I was under the impression that it would not be necessary to formally prove that the term tuberculosis as it is now employed by medical men and veterinary surgeons relates to one and the same disease. I thought that I might ask my audience to accept it as proved, and generally admitted, that tuberculosis in man is caused by a single definite species of organism—the tubercle bacillus—that this organism is also the cause of the disease to which veterinary surgeons apply the term tuberculosis in the case of cattle and other domesticated species, and that there therefore existed a *prima facie* case against the germs formed in the bodies of tuberculous animals as a possible source of tuberculous disease in human beings.

To-day, however, the position of anyone who undertakes to discuss the inter-communicability of human and bovine tuberculosis is very different from what it would have been a week ago, for in the interval the greatest living authority on tuberculosis—the world-renowned discoverer of the tubercle bacillus, and the man to whom we are mainly indebted for our knowledge of the cause of tuberculosis—has declared his conviction that human and bovine tuberculosis are practically two distinct diseases. I do not know how far the reasons assigned by Dr. Koch for the opinion which he now holds on this question may have commended themselves to the members of this Congress, and I am overwhelmed at finding myself in a position which compels me to offer some criticism on the pronouncement of one the latchet of whose shoes I am not worthy to unloose.

That bovine and human tuberculosis are identical diseases was generally supposed to have been finally determined by Dr. Koch himself, when he discovered that the human and the bovine lesions contained bacilli that were identical in morphological, tinctorial, and cultural characters, and showed that the artificial cultures from both sources produced indistinguishable effects when they were employed to infect a variety of animals. The labours of hundreds of workers during the succeeding eighteen years produced nothing in serious conflict with the conclusion that human and bovine tuberculosis were identical diseases, but they brought to light what appeared to be additional evidence of this identity, such as the discovery that tuberculin produced a specific reaction in tuberculous cattle, whether human or bovine bacilli had been employed in its preparation. In short, the identity of the bacilli from the two sources appeared to be as firmly established as any other generally accepted opinion regarding the identity or non-identity of bacteria associated with disease in more than one species of animal. Since it thus appeared to be proved that the only difference between human and bovine tubercle bacilli lay in their accidentally different position—one being parasitic in man and the other in cattle—it was natural to conclude that, when circumstances were favourable for the transference of bacilli from one species to the other, human tuberculosis might have an animal origin, and *vice versa*.

Opinions varied as to the frequency with which this transmission of tuberculosis from one species to the other occurred, but practically never within the last eighteen years regarding the possibility and probability of such reciprocal infection. What are the grounds upon which we are asked to discard convictions that appeared to rest on such a solid basis? I shall endeavour to state them briefly, as I understand Dr. Koch's train of reasoning.

(1) The bacilli found in cases of bovine tuberculosis are much more virulent for cattle and other domestic quadrupeds than the bacilli found in cases of human tuberculosis.

(2) This difference is so marked and so constant that it may be relied upon as a means of distinguishing the bacilli of bovine tuberculosis from those of the human disease, even assuming that the former may occasionally be found as a cause of disease in man.

(3) If bovine bacilli are capable of causing disease in man, there are abundant opportunities for the transference of the bacilli from the one species to the other, and cases of primary intestinal tuberculosis from the consumption of tuberculous milk ought to be of common occurrence. But post-mortem examination of human beings proves that cases of primary intestinal tuberculosis are extremely rare in man, and therefore it must be concluded that the human subject is immune against infection with the bovine bacilli, or is so slightly susceptible that it is not necessary to take any steps to counteract the risk of infection in this way.

Now, with the utmost diffidence I venture to submit that at least one of the premises contained in this argument is not well founded, that the others have little or no bearing on the question, and that there still remain reasonable grounds for regarding tuberculous cows' milk as distinctly dangerous to human beings.

It cannot be denied that what may be called bovine tubercle bacilli are as a rule distinctly more virulent for cattle and other domesticated animals than human bacilli, or that the results of experiments indicate that in natural circumstances there is little danger of cattle becoming infected from human beings. But it cannot be admitted that the low virulence of human bacilli for cattle proves, or even makes it probable, that bovine bacilli have only a feeble pathogenic power for man. That might have been held to be probable if it had been shown that bovine bacilli were very virulent only for cattle, but since it is well established that these bacilli

are highly dangerous for such diverse species as the rabbit, horse, dog, pig, and sheep, and, in short, for almost every quadruped on which they have been tried, it appears to be highly probable that they are also dangerous to man. At any rate it is impossible to cite any ascertained fact relating to other bacterial diseases that makes the contrary conclusion probable. It is well known that the majority of disease-exciting bacteria are harmful to only one or two species, but all those that are common to all the domesticated animals are also pathogenic to man.

With regard to the view that the difference between human and bovine bacilli in respect of virulence for cattle is of such a fixed and constant character that it may be relied upon to distinguish the one from the other, it need only be said that that is very far from proved. It appears to be quite possible that what may be called the normal or average virulence of bovine bacilli for cattle may be reduced by passage through the human subject. Besides, there are very great differences in the virulence oftubercle bacilli found in animals of the same species, and if a low degree of virulence for cattle is to be taken as the distinguishing feature of human bacilli, there will be no difficulty in proving that the human disease is sometimes transmitted to the lower animals.

The third proposition in Dr. Koch's argument is the only one which is really germane to the point at issue, viz., that only cases of primary intestinal tuberculosis can possibly have had their origin in infected milk or meat, and that "such cases are extremely rare." Dr. Koch refers to several large series of post-mortem observations that appear to justify this statement, and adds that he could have cited many more pointing to the same conclusion. Now, if it were a fact that all the statistics relating to this point were unanimous, it would have to be admitted that primary intestinal tuberculosis is rare in the human subject, and that cases of infection through milk are still rarer, though even then it might be advisable to take measures to prevent the few cases. But the statistics are not by any means unanimous, and those that are likely to appeal with most force to the people in this country are not at all in accord with those quoted from Germany. During the last few years the evidence obtainable from the post-mortem records of two of the largest hospitals for children in this country have been analysed with great care, in order to see what evidence they afforded as to the relative frequency of the different methods of infection in tuberculosis. In the case of the Hospital for Sick Children in Great Ormond Street, this has been done by Dr. George Still, and in the case of the Royal Hospital for Sick Children in Edinburgh by Dr. Shennan. The conclusion at which Dr. Still arrived was that in 29·1 per cent. of the cases of tuberculosis in children primary infection appeared to have taken place through the intestine. That is very far from being an insignificant proportion, and it is a striking fact that Dr. Shennan arrived at an almost identical conclusion, and estimated that 28·1 per cent. of the cases of tuberculosis among children in Edinburgh are due to alimentary infection. There does not appear to be any ground for supposing that there is a large margin of error in these statistics, as the number of cases dealt with was considerable (547 in the two series), and in both series the post-mortem appearances were interpreted in a way to which no exception can be taken. In face of these statistics it is not possible to assent to the statement that cases of primary tuberculosis of the alimentary canal are extremely rare. Precisely the contrary conclusion is the one that must in the meanwhile be drawn with regard to the state of affairs in this country, viz, that, at least in children, primary infection by way of the alimentary canal is comparatively common.

I therefore submit that there is still a strong *prima facie* case against animal tuberculosis as a possible source of human tuberculosis, and it becomes necessary to consider whether there are any data from which one may estimate the extent of the danger to which human beings are exposed through the occurrence of tubercle bacilli in milk.

The evidence in favour of the view that the ingestion of tuberculous milk is one of the causes of human tuberculosis includes a number of recorded cases in which the relationship of cause and effect appeared to be obvious. From the nature of the circumstances, evidence of this kind is very scanty, and it must be admitted that very few of the alleged examples are absolutely convincing. Tuberculosis is a disease that develops slowly, and, assuming for the moment that tubercle bacilli do occur in milk, and are a cause of disease in persons consuming such milk, it is obvious that, as a rule, the very act by which the infection is brought about destroys the only direct evidence of cause and effect that exists.

One could only expect to be able to trace the disease to the milk when, after the onset of symptoms pointing to infection by way of the mouth, the cow fromwhich the milk had been obtained was still available for examination. In practice this is rarely the case, and it is therefore not surprising that medical literature contains very few specific instances of the infection of human beings with tuberculosis by means of milk. It is obvious, however, that the entire absence of evidence of this kind would in no way exonerate milk from the suspicion of being one of the causes of human tuberculosis.

We have already seen that, at least in this country, in a considerable number of cases of tuberculosis occurring in early life, the first seeds of the disease appear to have entered the body by way of the mouth. What proportion of these cases ought to be ascribed to tubercle-infected milk? It scarcely appears to be possible to give a very confident reply to this question, though some distinguished authorities have not hesitated to express the opinion that practically all the cases of primary intestinal tuberculosis occurring in childhood may be set down to this cause. The late Sir Richard Thorne Thorne, in the Harben Lectures on the administrative control of tuberculosis, which he delivered in 1898, expressed his conviction that tuberculous milk was the main cause of *tabes mesenterica* in children, and he characterised the loss of child life from this cause as appaling. The evidence on which this formidable charge was laid against the milch cow was of the following nature. The Registrar-General's returns show that during the last fifty years there has been a marked decline in the death-rate from human phthisis, which is the form that tuberculosis generally takes when the bacilli are inhaled. On the other hand, during the same period there has been only a slight decline in the death-rate at all ages from that form of tuberculosis which is ascribable to alimentary infection, and among children under one year of age there has been a notable increase in the mortality from that form of the disease. The decline in the death-rate from phthisis is ascribable to the great improvements which have been effected during the last fifty years in the hygiene of human habitations, such as improvements in lighting, drainage, and ventilation. These, naturally, have not interfered with infection through milk, which has therefore remained unchecked, and in infants has even increased, because, during the last fifty years, cow's milk has entered more largely into the dietary of very young children.

There are several weak points in this argument. Perhaps the weakest of all is the assumption that the deaths certified under the head of *tabes mesenterica* correspond closely with those which the pathologist would classify as cases of primary alimentary infection. It is scarcely possible to doubt that the term *tabes mesenterica* in the

Registrar-General's Returns covers a heterogenous collection of cases, of which the majority may not be cases of tuberculosis at all. But even if it is agreed to accept all the cases registered under the head of *tabes mesenterica* as instances of primary alimentary infection, the figures found in the Registrar-General's Returns do not support the contention that milk is responsible for all the cases of *tabes*. It is true that they indicate an increase in the death-rate from alimentary tuberculosis among children under twelve months old, but, on the other hand, there appears to have been a considerable decline in the death-rate from the same cause at all ages between one and five years. Now, if tuberculous milk were a frequent cause of tuberculosis, one would not have expected the death-rate from that cause to decline among children between one and five years of age, for there is no reason to suppose there has been any decline in the use of cows' milk in the feeding of children at that age during the last fifty years. The fact appears to be that the Registrar-General's Returns do not afford much trustworthy information with regard to the number of cases of primary alimentary tuberculosis, and are absolutely worthless as an indication of the extent to which human beings are infected by means of milk.

There is another direction in which one may turn for evidence on this point. We cannot with any pretence to accuracy ascertain the number of persons that annually become infected by milk, but we may be able to form some estimate of the existing danger in this connection by collecting information as to the frequency with which milk contains tubercle bacilli. We know that about thirty per cent. of all the cows giving milk in this country are tuberculous in some degree. This statement no doubt indicates a deplorable state of affairs, but in the present connection it is not quite so alarming as it at first sight appears. Fortunately not every cow that is tuberculous gives milk containing tubercle bacilli. It is true that opinions with regard to this point are not absolutely unanimous, but there is ample evidence to justify the assertion that as a rule the milk is not dangerous until the udder itself becomes diseased. The experiments pointing to an opposite conclusion form only a small minority, and the results obtained in most of them were probably due to carelessness on the part of the experimenter. In a few of the cases in which the milk of an apparently healthy udder was found to be infective, it is probable that the gland tissue was in reality diseased, though not to an extent discoverable without microscopic examination. The important question, therefore, is not what proportion of milch cows are tuberculous, but what proportion of them have tuberculous udders. Some authorities have estimated this to be as high as ten per cent., but the proportion is certainly much less than that in Great Britain. My own experience leads me to think that about two per cent. of the cows in the milking herds in this country are thus affected. Now, the milk secreted by a tuberculous udder always contains tubercle bacilli, and it sometimes contains enormous numbers of them, and when these facts are apprehended one begins to realise the seriousness of the danger to which, in the present state of affairs, those who drink uncooked milk are exposed. But there are one or two considerations that make the danger greater than the mere statement of the number of cows affected would at first sight indicate. In the first place, the udder disease is not attended by any pain or tenderness in milking, and the milk for a considerable time after the udder has become manifestly diseased may appear quite wholesome, though in reality it is charged with the germs of tuberculosis. It therefore often happens that the gravity of the condition is not realised by the milker or the owner of the cow, and the milk continues to be sold for human consumption. There is scarcely any room for doubt that if it were sold and consumed unmixed with other milk, some of the persons partaking of it would become infected. In practice it is usually mixed with the milk from other cows that have healthy udders, and thus the germs are distributed among a larger number of persons. Even tuberculous milk that has been thus much diluted may prove infective, but the danger to the individual consumer is in inverse proportion to the degree of dilution.

Since about one cow in fifty is the subject of tuberculosis of the udder, and the average number of cows in the milking herds of this country is less than fifty, it follows that the majority of dairies and farms supply milk that is free from tubercle bacilli, or at least does not contain any derived from this source. On the other hand, when the infected material is present, it operates with the greatest intensity in the milk of single cows, and in the mixed milk from small herds.

It must be added that tuberculous disease of the udder is not the only source of tubercle bacilli found in milk. A great deal of the milk in the market contains a considerable quantity of dust and dirt, most of which comes from the cow's udder and the hands of the milker, and part of the dust of the air of the cowshed. When thirty per cent. of the cows in a byre are tuberculous, the dirt in that building, and the atmosphere in it, are almost certain to contain tuberele bacilli, and some of these are very likely to find their way into the milk. The more dirt milk contains, the greater is the chance that tubercle bacilli from that source may be present.

What has been said with regard to the extent of the danger to which the public are exposed through the sale of milk containing tubercle bacilli may be summed up as follows :—The danger cannot be defined by stating how many persons are thus infected annually, or what fraction the persons thus infected form of the total number who contract tuberculosis in the course of a year. At the same time, it is impossible to doubt that the danger is a very real one, since at the present time milk is a vehicle by which tubercle bacilli are often introduced into the bodies of human beings.

MEANS OF AVERTING THE DANGER.

The ideal method of counteracting this source of human disease would be to stamp out bovine tuberculosis, or to prevent the sale of milk from every cow that is tuberculous. Unfortunately, it must be admitted that at present that is unattainable. At the present time probably not less than thirty per cent. of all the breeding and milking cattle in this country are in some degree affected with tuberculosis, and to urge that the disease should be attacked on the lines adopted in dealing with cattle plague and pleuro-pneumonia is an effectual method of preventing any Government from touching the subject. But, although the complete and rapid extermination of the disease is impossible, it does not follow that nothing can be done, or ought to be done, in the way of prevention. The disease has attained to its present alarming proportions simply because, until quite recently, altogether erroneous notions were held regarding its cause, and because there has hitherto been the most absolute neglect of the precautions necessary for its prevention. The greatest obstacle to successful action against tuberculosis, whether in man or animals, is the ignorance of the laity regarding the cause of the disease. The immense majority of cattle owners are not yet convinced that contagion is the only cause of tuberculosis, and very few of them have yet made the slightest effort to check the spread of the disease. As a rule, cows and other cattle visibly ill from tuberculosis are still left alive and in close association with their fellows, although the lowest grade of common sense and prudence would suggest that such animals ought to be promptly killed, or, at least, isolated. It is not want of common sense, nor is it mainly lack of means, that is responsible for this

inaction ; it is simply a want of conviction on the part of cattle owners that tuberculous animals are dangerous to their companions.

The first thing necessary in this connection is education of the people regarding the nature of the disease. It is necessary, because in this country, where Parliament never moves except by the force of public opinion, the legislative action required will not be taken unless the people are satisfied of its wisdom, and also because even the most drastic sanitary measures enforced by the law are likely to fail if they are not supplemented by the intelligent co-operation of the people. The National Association for the Prevention of Consumption and the Royal Agricultural Society have been endeavouring to disseminate sound views regarding the cause of bovine tuberculosis among farmers and others, but much remains to be done in this direction. But it is not reasonable to ask that things should be left as they are until the education of the farmer in the matter of tuberculosis has been finished. If there are any practicable and reasonable measures by which, figuratively speaking, the flow of tubercle bacilli from tuberculous cows to healthy human beings can be stopped or impeded, they ought to be immediately enforced.

As soon as the valuable diagnostic properties of tuberculin had been proved by experience, it occurred to a good many people that its assistance ought to be called in in order to exclude tuberculous cows from milking herds. In other words, it was thought that although it might not be practicable to insist upon the application of the tuberculin test to all infected herds, and to compel the isolation or slaughter of all cattle thus found to be infected, it might still be possible to require that only cows found to be free from the disease by the application of the test should be kept for milch purposes. I doubt whether anyone who is well acquainted with the circumstances of the case now believes this practicable. Here, again, the fact that one-third of the cows now giving milk are tuberculous is an insurmountable obstacle. The cost of carrying out the tuberculin test several times annually in all the milking herds in this country would be enormous, and the exclusion of all reacting cows from such herds would seriously disorganise cattle breeding as well as milk production. Moreover, to rely blindly on the tuberculin test, and to pronounce the milk of every cow that does not react to it free from tubercle bacilli, would be very unsafe. The test is recognised to be one of great value, but it it is not infallible. Rather serious defects in connection with it are :—(1) that for a period after infection—a period that is sometimes very considerable—an animal will not react ; (2) that in some advanced cases of tuberculosis no distinct reaction is obtainable ; and (3) that in a considerable proportion of cases a second reaction is not obtainable for some days or weeks after the first. It is therefore clear that if we wish to exclude the milk of tuberculous cows, or if the object is the more restricted one of preventing the sale of milk from tuberculous udders, some system of inspection is necessary. This was the conclusion at which the Second Royal Commission on Tuberculosis arrived. We have already seen that whatever danger attaches to milk comes mainly from the cows with tuberculosis of the udder and the public health would be almost entirely safeguarded from this danger if we could exclude such animals from our dairies. Periodic examination by competent inspectors would go a long way to securing this object, but the inspection would require to be at rather short intervals, for a tuberculosis of the udder may come into existence and attain most dangerous dimensions in a period of a few weeks. The more frequent the inspection the better, but, of course, this means a great deal of expense.

If every town and rural district produced its own milk, it would be a comparatively simple problem to organise and carry out a fairly efficient system of inspection of milch cows ; but as the law at present stands, the majority of the population cannot obtain this safeguard. With the exception of Glasgow, Manchester, and a few other places, a local authority has no power to inspect cows outside its own district, and the helpless position in which this state of the law leaves the inhabitants of London and other large towns is obvious. If cows of which the milk is sold for human food had everywhere to be submitted to periodic inspection, such inspection would naturally be undertaken by the various local authorities, each of which would supervise the cows and cowsheds in its own district ; but the compulsory inspection of all the milch cows in the country would be a very large undertaking, and perhaps it would be premature to press for it. In the meantime, a good case can be made out for making general the special powers relating to inspection of cows in outside districts which a few fortunate cities have acquired by special Acts of Parliament. This also was one of the directions in which the members of the Second Royal Commission on Tuberculosis considered immediate action to be necessary.

There remain for consideration some other safeguards which would doubtless be less effective than those just discussed, but which, unlike these, would not be difficult to enforce, viz :—(1) compulsory notification of udder disease and of any symptoms of tuberculosis in milch cows, with, of course, the power to inflict a considerable fine for not reporting ; and (2) the interdiction of the sale of milk from any cow suffering from tubercular disease of the udder, or exhibiting clinical signs of tuberculosis. Against the demand for the amendment of the existing law to the extent of granting the public these very reasonable safeguards against infection through milk it cannot be urged that they would be very expensive, or that they would press harshly on private interests. The present state of the law, or rather the almost entire absence of any law, dealing with tubercular udder disease in cows, is a scandal and a reproach to civilisation. It scarcely sounds credible, but it is a fact that the owner of a cow in the most advanced state of tuberculosis, and exhibiting the most manifest signs of udder disease, may sell that cow's milk for human food as long as the sale has not been specially interdicted on the certificate of a veterinary surgeon, and no penalty attaches to this crime of deliberately or carelessly placing on the market a food material charged with the germs of a dangerous disease.

In the interests of public health, the sale of milk from tuberculous udders, and from cows that are obviously tuberculous in any part of the body, must be stopped, and it must be declared illegal to keep such animals alive. There need be no hesitation in pressing for this reform, because the measures demanded are in the interests of the owners of cattle, and would be advisable even if it were established that bovine tuberculosis is not transmissible to man. There is no dispute as to the danger of visibly tuberculous animals to others of their own species, and it is the very reverse of a hardship to the owner of such animals to insist on their being slaughtered.

It would probably be regarded as a serious omission if I did not refer to one other method of counteracting whatever danger at present attaches to impure milk as a cause of human tuberculosis. No matter how highly charged milk may be with tubercle bacilli, it can be deprived of all danger from that source by raising it to the temperature known to be fatal to these germs. Less than the boiling temperature (212° F.) suffices for this purpose ; but, unfortunately, the lowest temperature that can be relied upon imparts to the milk a flavour that many people find distasteful. That objection does not hold good in the case of infants and young children

and the custom of boiling or steaming the nursery milk for a few minutes cannot be made too general. But while abstinence from uncooked milk is a sure way of avoiding infection with bacilli present in that article of food, it cannot for a moment be admitted that this absolves public health authorities from all concern with the subject. Arsenical beer may be made harmless by adding the proper antidote before drinking it, but the most courageous brewer would not plead this as an excuse for selling the impure article.

In conclusion I would venture to express the earnest hope that the Congress will not endorse the view that it is inadvisable to take any measures to prevent the transmission of tuberculosis from the lower animals to human beings. To justify the introduction of measures to that end it is not necessary to contend that this is a common method of infection, or that the danger arising from milk can for a moment be compared with that present in human sputum. The inhalation of tubercle bacilli expelled from the bodies of human patients is doubtless the great cause of human tuberculosis, and every practicable means of preventing infection in that way ought to be employed; but, at the same time, we ought not to concede to the milkmen the right to sell us tubercle bacilli, even if we were assured that—like Dr. Koch's experimental pigs—we had nothing to fear beyond the development of "little nodules here and there in the lymphatic glands" of our necks and "a few grey tubercles" in our lungs.

VETERINARY SOCIETIES.

EASTERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

(*Continued from p. 56*).

DISCUSSION.

["Some Accidents to the Foot of the Horse and Some Accidents after Parturition."—By GLADSTONE MAYALL, M.R.C.V.S.]

The PRESIDENT, in opening the discussion, thanked Mr. Mayall for contributing so interesting a paper. With regard to open joint or picking up nails in the foot, he had in a great many cases poulticed, but he quite agreed that carried too far poulticing did harm. The great thing was to open the wound and get a good dependent orifice. It was very essential in the case of a mare to remove the placental membranes very quickly, but in the cow he did not think there was any real necessity. Where a cow calved a week or two before her time it was most difficult to get the membranes away. Injections in the case of the cow he believed did good as a certain amount of matter was removed. It might not prevent blood poisoning, but it caused the cow to strain and then the membranes came away much more quickly than if allowed to remain in the dry state.

Mr. J. D. OVERED said they had reason to congratulate Mr. Mayall upon his paper and personally he had received two or three valuable hints. One matter was omitted for which he had listened, and that was eversion of the rectum which was not infrequent in mares during parturition. He had had several cases and only in one instance did he have a recovery. He had two or three cases at one place, a mare with eversion of the uterus, and another with everted rectum. He was fortunate enough to succeed in the former but the other mare died. In another case this year to which he was called a mare had everted the rectum and it was returned before he arrived. He made an examination and found it apparently properly done, there was no obstruction or folding but nevertheless the mare died. The retention of fœtal matter was of almost every-day occurrence in cows and was of comparatively little importance. At certain times of the year fœtal membranes might be left in cows without anxiety. They could be removed, and as a rule he did so, but when a cow calved before her time he generally gave nursing treatment and the case did well. He did not think there was so much damage as some people imagined from the absorption of fœtal matter as there were seldom any serious results in cows, but in the case of mares it was highly important and they could not be too careful in removing them. If they neglected to do so not only would they have acute laminitis but it sometimes proved fatal.

Mr. A. S. AUGER said he had a remarkable case of wound in the foot. He was called to a heavy cart mare which had been lying about and showed peculiar symptoms of knuckling over at the fetlock joint of the hind foot. There was swelling of the fetlock, hock, and thigh and of part of the mammary gland. The history he gathered showed she had been previously used for cutting chaff. In getting round she got her foot under the spindle and he diagnosed it as bruised fetlock with a certain amount of cramp. He left a suitable application and gave directions. When he saw the horse a fortnight afterwards the same symptoms were still shown. She could walk a long distance apparently quite sound and he did not notice any great difference in the stretch of the two feet, but all at once she would knuckle over. Before he left he examined the foot and found driven in at the heel a nail with a head the size of a sixpence, forward towards the mare's toe. It seemed to have been driven in by constant pressure. He had to make a big wound to get it out, but the mare went on all right from that time. A frequent cause of lameness in horned stock was the picking up of the small toe clips used on boys's boots. These were small and likely to be overlooked. He believed in the lactic acid treatment and had used it with good results for punctures and open joint. Three weeks since he was called to a baker's horse that had trodden on a piece of granite and literally pressed the sole of the hind foot right in. It had been poulticed but he took the poultice off and applied lactic acid on tow, tied a piece of canvas over. It did far better than he expected, and improved from that time. Lactic acid was a grand agent, and every one should try it. He had a remarkable experience of two cases of eversion of the uterus in one night. When he was called to the first he told his client the mare would be dead before he got there. It proved to be so, but the foal was alive and a good one. On his way home he met another client who said he thought his mare had twin foals. When he arrived he found the mare had foaled. Twin foals came together and also the womb. He replaced it and the mare never had a symptom of fever about her. Three weeks afterwards she ran away with a water cart full of water behind her so that she had made a good recovery. Neither by pulse or thermometer had there been any sign of fever, but he was called within ten minutes of foaling. Where the uterus was out from an hour to an hour and a half the case might be regarded as final and fatal, septic peritonitis being determined at once. Some of his clients did not approve of injections, but he had used them both for mares and cows with satisfactory results, but the quantity should be large. One practitioner recommended a large injection and then to finish with an injection of hot water, afterwards tepid sufficient to cause contraction of the uterus.

Mr. THURSTON said he was a very young practitioner, but he had the misfortune to meet with two rather rare cases, both of complete eversion of the bladder. In the first instance he was called out at night in pouring rain

and after a four miles drive arrived at the farm. He found a mare foaling, absolutely normal, the anterior position, two fore feet and the head, but in addition there was what appeared to be a fleshy looking substance at one side of the head of the foal. Making a casual examination by candle light he thought at first it was the side of the vulva protruding, but when he stripped he found it was the bladder completely everted. He effected delivery at once and after very little trouble replaced the bladder. All seemed to go on well for a day or two but on the third day she began to flag and ultimately died on the ninth day. He would like to know the cause of the eversion whether due to the rupture of the ligaments when the real labour pains came on, or to any other causes. He made a post-mortem, but putrefaction had reached an advanced stage and he had not the opportunity to observe so carefully as he desired the state of the ligaments of the bladder. Another question he would like to ask was what was the cause of death. He found a certain amount of metritis, but not peritonitis, and attributed death to paralysis of the bladder. Each day he had had to draw off the mare's urine as she was unable to pass it herself. Fortunately the animal was insured. In the second case a filly belonging to his uncle turned out to marsh last year had the misfortune to get in foal. Until the later stages they could not realise that she was in foal. She had rather peculiar labour pains and ultimately a breech presentation was found. He was working to pass a cord under the hocks to effect delivery, the foal being dead, when the bladder was everted. It was replaced, delivery proceeded with and as soon as that was effected they had eversion of the rectum to contend with as well. They then destroyed the mare. He would like to know the cause for eversion of the bladder in such a case.

Mr. W. SHIPLEY, JUN., said he had been delighted to hear the paper, and so far as injuries to the foot were concerned he agreed to a very great extent with Mr. Mayall. He certainly agreed with hot poulticing. Sufficient thought was not given to the fact that hot poulticing relieved pain. There were cases when one would not poultice except for the great pain, which the poultices immensely relieved. The effect of a hot poultice was to a great extent due to the relief it gave from pain. He thought they had got rid of the old idea of putting an ordinary poultice on. One should always put an antiseptic in. There would always be a difference of opinion as to the removal of the placenta. In the cow it did not seem to matter much whether it was taken away or not. He always endeavoured to satisfy his client in this particular. In the mare it should always be removed. He had an extraordinary case this year. A mare had been after foaling but was not noticed till labour pains came on. He went and removed a dead foal, and when he went the next day to remove the placenta he found it a great deal more trouble than removing the foal. Until this case he had always been opposed to injections into the uterus either of the mare or cow—though he injected them to a certain extent and washed out the uterus—as he thought it left a certain amount of fluid it was difficult to remove. In this case he took a Reid's stomach pump and used a pailful of Jeyes' fluid solution. The second day he removed what portions he could and washed away a considerable portion. He quite expected the mare would die, but he never had a case do better. He had occasionally met with eversion of the bladder in ordinary parturitions. Last year he had a case of a mare which 48 hours after foaling was in great pain and he could not understand why. On examining her he found an enlarged mass. The man said that when the mare foaled something came out and he put his hand in and pushed it back, and it had dropped over on to the rim of the pelvis. After a little manipulation he found it was the bladder, put it back, and the mare was never really ill. He had told his client she was sure to die as it was very much swollen and the neck of the bladder very large, but it went back easily. Where they had to deal with eversion of the uterus in the mare one did not expect to get very good results, but in the cow they might be hoped for. He was rather surprised Mr. Mayall in suggesting sutures for the vulva did not mention the clamps which were now so much advertised. He had used them in many cases, but the instrument as now made was not large enough. If they had a sensible one made it would be found of immense benefit. In the case of a cow about calving if there was any sign of the vagina protruding he either put a clamp on or left it with the attendant to put on immediately she had calved. They were very easy to use, and much nicer than sutures. or any other means. He had heard veterinary surgeons say that mares did not frequently die after eversion of the rectum. He had a case this year where a mare everted her rectum before she foaled. His assistant put it back, delivered the foal, and when he went she was apparently all right. When he went again it was out and quite down to her hocks. He passed a long tube of Reid's pump as far as he could and doubled it back on that, and tried to put it in proper position, but the mare died and he was not able to make a post-mortem examination. It would have been useful if Mr. Mayall could have given them some idea of the connection between metro-peritonitis, septic metritis, and laminitis. He had not the least doubt in his own mind that laminitis following parturition was septic laminitis. One should never fail to examine the uterus and keep it in an aseptic condition when dealing with a case of laminitis.

Mr. H. P. STANDLEY described a case to which he was called where a mare had foaled about nine o'clock one morning and had been left till at six o'clock at night she was heard knocking about and then it was found that her uterus had just begun to come down. First a neighbouring farmer was sent for, who called in Mr. Standley, who arrived about ten o'clock and found the mare lying on her side with her uterus quite out and a good deal of hæmorrhage. He advised that the mare should be shot, but the owner was unwilling to do this, and he offered to put back the uterus and let the mare take her chance. He washed the uterus, got the mare up, used no antiseptics, put some sutures into the vagina, and strange to relate that mare made a splendid recovery, and did not ail at all. There was no laceration, but the whole of the womb was quite out and full of inflammation and he only dealt with the case for the satisfaction of the owner. He had a case of eversion of the rectum and put that back, but the mare unfortunately died.

Mr. G. HUNTING said he was recently called to a mare in foal which was turned out in a field from which gravel had been dug. She got into one of these sand-holes and lay with one hind leg in the hole, unable to get out. During that time she foaled prematurely, and the whole of the womb became everted. When he saw her she had been pulled out of the hole, but she could not stand. She was placed on a sledge and conveyed to a stable. Her womb was literally torn and jagged. All the internal surface was completely jagged and the uterus was as black as his coat. He got a copper of water and thoroughly cleansed it, using some disinfectant. After working hard for four hours, continually washing it with warm water, he got it back. Then he made a solution of about half-an-ounce of carbolic acid in three gallons of water, and using a large enema syringe injected three parts of a pailful, keeping his hand in it for the best part of half-an-hour until the womb commenced to contract. Then the mare was got on her feet and her hind feet were raised until they were two feet higher than her fore feet, and they had her watched. Pieces as large as his hand sloughed away, sometimes two or three pieces in a day, but the mare made a complete recovery. She was injected twice a day, and he used that famous

liq. carbonis detergens. (Laughter.) He advised that she be not covered again, and she had since been sold. In another case where a mare had got rid of a foal, and straining herself violently, threw herself down whenever she got a chance, it was thought that there must be another foal. She was swollen and one of the cornuas was partially inverted. He righted it and injected about half-a-pailful of Jeyes' Fluid or Augean fluid, (Laughter), and some chloral hydrate hypodermically. The mare was kept moving about, and after an hour she got better and gradually recovered.

Mr. MAYALL, in his reply on the discussion, said he had not had to deal with eversion of the rectum. Sometimes the rectum had come out during the act of parturition and he had put it back quite easily. It had not come out again. In permanent eversion of the rectum with which he had not had to deal, common sense suggested that they should operate under chloroform, and tell the owner the chances were about equal. After chloroform was given they could amputate the rectum, and the mare would stand a better chance than if they merely put it back. Mr. Auger had mentioned lactic acid, and he was glad to hear that Mr. Auger's experience confirmed his own. He quite agreed that time was of the greatest importance in eversion of the womb. If they were there early they stood a much better chance than if they were late. Where the womb had been hanging down and was lacerated they had something very serious to deal with. He had seen a vulva clamp used and also seen them tear away, perhaps for the reason that the points were not long enough, and being short, when the mare strained violently thrust them out, which gave them laceration of the vulva also to deal with. If they used tapes, and took good hold of the skin on each side, he would guarantee they would never come out. He quite agreed as to the necessity in laminitis of keeping the womb antiseptic. What connection there was between mischief of the womb and laminitis they usually put down to sympathy—a very vague word—perhaps another term for ignorance. The fact remained that there was an intimate association between womb mischief and laminitis. Mr. Hunting's case was very interesting, and he was glad to hear him say he injected the womb twice daily. His case proved that there was no harm in injections, and contradicted those practitioners who said you should not inject the womb of the mare. He thanked them for the kind way in which his paper had been received and criticised.

Mr. W. SHIPLEY, Jun., then moved a vote of thanks to Mr. Mayall. He must have gone to some trouble to prepare it. They appreciated the efforts of any veterinary surgeon who wrote a paper and endeavoured to promote a discussion at their meetings.

The PRESIDENT, in seconding, said they had had a capital discussion, which was one of the things always looked forward to at their meetings.

The meeting ended with a vote of thanks to the President, proposed by Mr. T. E. Auger, and seconded by Mr. W. Shipley, Sen. The members then took tea together at the Hotel, having had a most enjoyable and successful gathering.

F. B. O. TAYLOR, *Hon. Sec.*

YORKSHIRE VETERINARY MEDICAL SOCIETY.

A special meeting of the members of the Yorkshire Veterinary Medical Society was held at the Hotel Metropole, Leeds, on Friday, the 5th inst., to hear a paper on "Transport and Remount Work" by Professor Williams, Principal of New College, Edinburgh. Mr. Frank Somers (president) took the chair, and the attendance included Messrs. F. W. S. Clough, Morley; John McLean, Dewsbury; J. Atcherley, Harrogate; Herbert Pollard Wakefield; H. G. Bowes, S. Wharam, and G. E. Bowman, Leeds; H. Snarry, York; J. Clarkson, Garforth; A. W. Mason, Leeds; W. F. Greenhalgh, Leeds; Philip Deighton, Selby; T. Fletcher, Sheffield; J. E. Scriven, Tadcaster; R. C. Thompson, Doncaster; and A. McCarmick (hon. sec.), Leeds.

Letters and telegrams of regret at inability to be present were announced from Prof. M'Fadyean, London; Mr. Abson, Sheffield; Mr. Whitehead, Batley; and Mr. McKinna, Huddersfield.

The HON. SEC. read a letter from the Secretary to the British Conference on Tuberculosis acknowledging the generous contribution of the association and stating that the names of the four gentlemen—Messrs. Somers, McKinna, Wharam, and Clarkson—who had been deputed to attend the Conference, had been placed on the list of membership.

The PRESIDENT, in introducing Principal Williams, mentioned that some time ago that gentleman promised to read them a paper, but that he was then unable to attend owing to his duties in connection with the Remount Department in America. The present meeting had been convened in compliance with the requisition of several members, according to rule, and he need not say how pleased they were to have Principal Williams among them. (Applause).

TRANSPORT AND REMOUNT WORK.

By W. O. WILLIAMS, F.R.C.V.S., Edinburgh.

Perhaps a rough outline of the handling of horses and mules in the United States of America by our Remount Department may be of interest to the members of the Association. Of course, in connection with the purchasing I know nothing, nor do I know what the prices paid were, but that is a matter which hardly concerns us. You may take it from me, however, that the head of the Remount Department there during my stay knew well how to make a bargain, and took care that no one received more than market value for his bunches of mules or horses. In fact he could drive a bargain as well as any Aberdonian. Not only did he pit the dealers in towns against each other, but he pitted the dealers in certain States against those in others and consequently didn't pay too big a price for his stock. So well were matters arranged that when an order for so many thousands of mules and horses was wanted by such and such a date to sail in such and such ships, on such and such dates, I never remember our being without the stock ready and healthy to ship from New Orleans except once, and that was not due to the want of supplies, but to there being a great amount of sickness present among the horses, and to the season, being zero and blizzards in the North, and torrential rains and muggy heat with us in the South.

Sellers frequently paid visits to New Orleans in their endeavours to obtain contracts for bunches of stock, and in their cases none needed to apply unless they entered into agreements and found securities that, provided they obtained orders, they would fulfil them whether at a profit or a loss, but by hook or by crook they had to provide the stock in order and in sufficient number, and none would be paid for unless duly purchased by the officials of the Department. Veterinary-Captain Smith would sometimes buy two or three hundred a day, day after day, in different parts of the States, and would travel from place to place during the night, and on Sundays. He was the most indefatigable man I ever knew or knew of.

As animals were purchased they were at once branded, and they then became our property. It was the usual custom at first to leave them in the pens or yards of

the dealers until near the time they were wanted at New Orleans for their respective ships, but later on we took large grazings and kept them there, fed them on corn, and then brought them to New Orleans about ten or twelve days before they were to be shipped. This process assisted in accustoming them to a change of climate, and also gave them condition. It was the custom to buy animals to go in certain ships, for instance, 1000 mules would be bought for the "Iona," 900 horses for the "Cervena," or perhaps 1000 mules and 250 horses for the "Milwaukee," and when we knew that these ships were coming due we would order down their cargoes.

I might mention here that we always had a variable number of animals in hand in New Orleans which should have gone on other ships, but owing to accident, illness, or a deficiency in the capacity of some ship, they remained in New Orleans and were used to fill up vacancies owing to illness, etc., in fresh cargoes. The stock always came what to us Britishers seem very long distances, say 1,000 miles from up country or out West. They came in railway cars which held from 25 to 28 horses, cobs or mules. These cars seem to have been specially designed so as to expose the animals' legs to the hot or cold winds and draughts, and to close in all the foul air at the top and half stifle the animals. Many of the cars have hayracks and water troughs, which are worse than useless unless very carefully looked after.

The railway companies were keen competitors for the traffic, and all the trains (special ones always) were run at express speed. Arrangements were made to unload the stock for a few hours in the middle of the journey, and to feed and water them. The great disadvantages of this were two—namely, animals being injured in the loading and unloading, and animals perhaps occupying pens or stock-yards which might have held unhealthy stock, but we took every precaution to have these places reserved for our stock and to have them kept thoroughly clean. Cleanliness is a thing unthought of and considered quite unnecessary for animals in the Southern parts of the States, as far as I saw.

As the trains arrived with their stock, they were unloaded at one or other of the stock-yards, which were always specially cleaned, limewashed, and ready for them, hay, corn, and bran, and plenty of water with hyposulphite of soda in it being also there for them. By-the-bye, in Lousiana, or rather New Orleans, the natives all swear by the goodness of the water of the Mississippi, and the longshoremen and niggers drink it freely; in fact, in some parts of the town they have nothing else to drink!—well! It is brown in colour, has a smell, the deposit in a tumblerful is quite half an inch thick and quickly decomposes, and that's a sufficient description. I believe that what is used for drinking by the better classes is just the same, but has had its solid particles precipitated by iron or something, though in the hotels it is filtered, but never safe to drink undiluted.

The stock from the various purchasing stations as it arrives is kept by itself as much as possible. For instance, all Texan mules would remain at the Texas and Pacific stockyards; Missouri mules would go to Government Yard; Texan cobs would go to Slaughter Houses; Missouri horses to Commercial Street Press, and so on. Either at or in the immediate neighbourhood of these large places we had smaller places which were used as sick lines, and at them we kept supplies of medicines, etc. We also had a hospital (Richard Street) for horses, and a suspect depôt for mules (No. 8). Each of these places was in telephonic communication with headquarters. Most of these places when we rented them had to be fitted up for our purpose, as they were not built for such, and we often had considerable trouble in getting a good water supply, efficient drainage and ventilation. After the stock had been unloaded into the yards, we carefully inspected each animal, and with the aid of the men, cut out all that seemed at all lame or unhealthy and sent them to the sick lines for treatment. This process was gone through daily, so that, when the time came, we had one lot of healthy stock ready to ship.

Tetanus is a very common disease in Lousiana and is seen in a benign and acute form. Our animals, which had a good deal of knocking about one way and another, were sometimes injured by rails or sharp pieces of timber, or by picking up pieces of wire, and were consequently very liable to be affected with tetanus, but we adopted the precaution of injecting anti-tetanin, and never had a single case of tetanus, which says volumes for anti-tetanin, and from my experience there I would strongly recommend all practitioners in "tetanus" areas to use the anti-toxin. We started a gang of blacksmiths, who were continually at work among the stock attending to their feet—many of the mules had much grown feet and had heels and toes on their shoes. We also started a gang of men with machine clippers and half clipped the stock before putting them on board ship, which precaution we found of great value, as the stock at the beginning of the year had very heavy winter coats on, which soon became saturated with perspiration after they had been in our climate for a day or two, and would have tended to encourage attacks of pneumonia, etc. We also did it because it made the animals much cooler and more comfortable when on board ship and crossing the line. We had a small gang of men with a pump, with which they constantly went round the lines, spraying the walls etc, with carbolic acid and lime-wash.

You would probably notice that a deputation of those interested in the horse importation from America to this country recently waited upon the Minister of Agriculture and begged of him to take measures to insure the healthiness of the horses arriving in this country from America. The Minister—Mr. Hanbury—did not seem to view the matter at all seriously, but it *is* a serious matter; for I can assure you of two facts, first, that there is an enormous amount of contagious disease amongst horses in America—I speak comparatively—and secondly, no precautions worth speaking of are adopted to eradicate these diseases. I will ask one question, which perhaps will be a hint to interested parties. What becomes of the enormous quantity of mallein which is prepared in America? To give you an instance of the little regard paid to the proper care of horses in America, I have it on good authority that a bunch of horses bought by the American Government at the time of the recent Spanish war, which cost 125,000 dollars, though not even used for any military purposes, were so much depreciated in value that what were left of them sold for 25,000 dollars! a cash loss of 100,000 dollars, not to speak of the food, etc., wasted. Personally, I should be inclined to quarantine all imported horses, unless the veterinary inspectors at the ports of disembarcation were quite satisfied that they were free from contagious and infectious diseases, not only Glanders and Farcy, but Influenza, Strangles, and Skin Disease. This is a digression for which I crave forgiveness, but the matter is of so much importance that I couldn't pass it by without some reference.

The principal disease we had to contend with in New Orleans were those which so frequently affect animals which have been bunched together in unhealthy places, Pneumonia, Pleurisy, Pleuro and Broncho-Pneumonia, Strangles, simple and bastard, and Purpura Hæmorrhagica.

As the majority of our patients were over five years old it was rather unusual to see much strangles, but we had scores upon scores of such cases, and I inserted more tracheotomy tubes there than I had done in twenty years previously. All of these animals had been in the best of health, and in regular work prior to being gathered in Stockyards and pens for inspection, and no doubt they contracted the diseases in these places.

I fear I weary you, and will proceed to other matters. We have now got our animals selected and about ready for shipment, and the good ship (a British one of course) has just come up the river. As soon as she is unloaded, or has emptied out her ballast, or even before that is accomplished, we go on board and proceed to inspect her from stem to stern and from bridge to bilge, and at a time when she is empty, at anchor, and, if possible, when there is plenty of light—but not too much wind blowing. Before commencing this inspection copies of the plans of the ship should be procured, or rough plans made, and on these, which should be in triplicate, can be marked the places where stalls or pens may be fitted and where sick boxes have to be built, such as on the hatches and on the poop and near the bridge. As one proceeds notes must be taken of all the places, such as shafts, portholes, ventilators, and doors which give entrance or exit to good and foul airs, noting whether such currents are in action, for if there be no currents through these places artificial aid must be introduced in the shape of fans driven by machinery. It must be remembered that good ventilation is of the utmost importance on board a ship, and must be efficient not only when she is at sea and in a head wind, or having a wind blowing on her quarter, but also when she is running before a fair wind or when lying at anchor. In addition to the fans, shafts must be constructed of wood to conduct the air to the remotest corners of all parts of the ship where horses have to stand. These shafts should have slides or revolving doors in them which can be fixed to regulate the amount of air passing through them, and also to cause alterations in currents. Wind-sails must also be provided, twenty to thirty in number, and in addition to them should be made sleeves of canvas with hoops in them, which may be attached to the lower ends of the wind-sails, and so used for flushing the holds and other parts. Wind-scoops of galvanised iron should be made to fit each porthole, and as many doors as possible with safety should be left open.

The next proceeding is to find out what her water-tanks' capacity is, and calculate how much fresh water she can carry without having to condense, also note how much she can condense per day. As the tanks' capacity is usually given in tons, it is usual to reckon that each animal must have an allowance of 1-28th of a ton, or 8 gallons per day; so that one must multiply the number of animals by the approximate number of days on the voyage, making full allowance for delays owing to head winds, storms, etc., and dividing that sum by 28 gives the number of tons of fresh water that must be taken on board.

It may happen, however, that the transport has not sufficiency of tanks to carry the full quantity of water, and in such a case it will be necessary to condense. Condensing should be commenced early on the voyage, and the chief engineer should have no difficulty in using say one-sixth of No. 1 tank and then filling up with condensed, and passing on to No. 2 tank, use say one-fifth if necessary, and fill up with condensed. If this be done with the largest tanks there should be no difficulty in obtaining a sufficiency of water for a long voyage, none of which water will be in greater proportion than one of condensed to four of pure water. Arrangements must then be made as to the placing of at least one hydrant in each horse compartment, and on the main deck, on which there may be several hundred horses in three or four lines, numerous hydrants must be placed. In some of the smaller holds perhaps only one or two may be needed. Special precaution must be taken that no waste occur as that may result in terrible disaster.

The next thing will be to see that a pharmacy is erected in a convenient part of the ship, so that medicine can be obtained without much trouble, the neighbourhood of the bridge is most suitable. The pharmacy should be large, so as to store *all* the drugs, and well lighted night and day, fitted with a stout door and a good lock to it. As regards drugs, that is a matter of choice, but one thing I would point out, and that is, take all drugs as far as possible in such a form that they can be easily administered—say by subcutaneous injection, or in food or drinking water—as it is often a difficult matter to give animals drenches when on board a rolling ship, or when they happen to be standing 'tween decks, which is usually not sufficiently high to enable one to get the horse's head high enough up.

There are many other things of great importance—such as the inspection of hay, corn, bran, etc., prior to its being placed on board—in connection with the transport of animals by sea, but I have purposely only mentioned a few of the preliminary ones, so as to indicate how very necessary it is that a skilled person, and particularly a veterinary surgeon, should be at the head of such a department.

Now, having our ship ready, and our stock ready, we proceed to load it. Almost every one of the animals sent from New Orleans was walked on board. A very few indeed were slung on board, either in slings or in boxes, but we managed to so arrange the shoots from shore to upper or lower decks or to cattle doors, and alleyways from them to other shoots ("chutes") down the holds, that we had a minimum of handling and work, and it was no uncommon thing to load at the rate of 250 in an hour.

It is hardly necessary for me to enter into the detail of a last inspection of the stock—a walk through the ship to see that pads were at all corners and low places, bars at inclines, no nails sticking out, etc., etc.—and the arrangements with the Railway Companies, but I must say one word, and that is this:—before loading commences the ship must be most carefully moored to the wharf, allowances being made for the gradual sinking of the ship as she gets her cargo on board, and full play given to the shoots from shore to ship.

As the animals enter the shoot from the car they are blocked off so as to prevent rushes and crushes, and at the same time they are haltered. When they are allowed to go forward the first one may have to be led and the others follow like mules. As each mule goes on board his halter chain or rope (rope is best) is caught by a nigger, and the mule is led to his allotted place. These gangs of niggers at each shoot are usually thirteen in number with a gaffer, so that a gang takes two turns to empty a car, then the train moves along and other cars come opposite the shoots. We only had one fatal accident whilst loading, and that was a horse which took a mad jump and split his skull against the combing of the hatch. (Applause).

[The paper was illustrated by means of a number of well-prepared diagrams and models.]

Discussion.

Mr. Fletcher asked Principal Williams, in his reply, to explain the system of feeding the horses on the transports.

Mr. A. W. Mason, who, as it will be remembered, went out to Spain to purchase mules for the South African war, said no one could be more pleased with the paper than he was. The number of mules purchased in Spain by the commissioners was about 14,000. The cars used in that country resembled the ordinary cattle trucks in England except that they had not iron bars. What the Remount Department had to guard against in Spain were the classes of disease described in the paper. They experienced the same difficulty in regard to feeding and watering the mules in transport. He quite agreed with Principal Williams's estimate of the character of the mule. The mule liked those about him to be highly flavoured—to smell. He was not the malicious brute which he had been described. If he were treated with kindness he would respond with kindness, but if he were

knocked about he would retaliate by kicking. In regard to the feeding of the mules in transit by rail some experiments were tried. His opinion was asked, and he told them it would hardly answer to feed them in the trucks during journeys of fifteen to eighteen hours. Mules would not touch tainted food. As to the importation of horses into this country, Mr. Mason said it would be a good thing if something could be done in the way of inspection, but to keep the animals in quarantine for any lengthened period would mean the provision of miles of docks. Such a system would, for instance, prove inconvenient for sportsmen like the King and the Duke of Portland who sent their horses to race in France. The question of severe restriction was a knotty one. However, he thought that eventually there would be some sort of supervision as a result of the important deputations of which they heard.

Mr. G. E. BOWMAN remarked that the paper had been most interesting to him—indeed, he had not enjoyed a paper so much for a long time. The ignoring of veterinary advice in connection with the transport of horses had cost this country a good deal of money. As to the horse boxes on the English railways, they needed disinfecting like cattle trucks. Fifty per cent. of the horses which travelled to shows and races caught influenza.

The PRESIDENT congratulated the members upon having listened to such an excellent address, and observed that he had understood that the veterinary surgeons who went out to South Africa had achieved a most brilliant success and had placed the veterinary profession on a higher standard than it had ever occupied, but his attention had been called to a book, "Impressions of the War," in which the writer asserted that "Whoever else was a success, I feel most emphatically the English veterinary surgeon was not!" Perhaps Mr. Williams would give them his view of the matter.

Mr. CLARKSON and Mr. GREENHALGH testified to the excellence of the paper.

Mr. THOMPSON said that not only did he buy the majority of horses which went out with some of the Yorkshire Yeomanry, but went to Liverpool and inspected the corn and fodder. He also went from Sheffield with horses and saw them shipped at Liverpool. That, he thought, was the proper course to adopt in the transport of horses from this country.

Mr. WHARAM remarked that Principal Williams had given them a good deal to think over. A great amount of care was required to get animals to the seat of war in anything like condition. He had had a little experience of a stud of horses of which 200 were requisitioned by the Government and shipped to South Africa. The horses belonged to the Tramways Committee of the Leeds Corporation, and they were chiefly used for artillery and transport purposes. He should like to hear something more about the feeding of the horses on board the transports. He was told the animals which were put on board ship in good condition in this country landed in South Africa unfit for work of any kind. They were rushed up to the front, and when they arrived there they were very little use. That, he supposed, was the reason that what was called the "'bus horse" had got into such bad repute. It was his conviction that if more veterinary surgeons had been called in the animals would have arrived at the front in much better condition. If a system similar to the one described in the paper had been observed in this country they would not have heard so much about the inefficiency of our troops from the lack of horses.

Principal WILLIAMS, replying to the discussion, explained that there was not any method of feeding which would enable them to have a horse or mule on board ship for 25 days and land it in a fit condition to go straight to work. No horse ought to be expected to do any hard work, unless it had received 20 or 30 days' proper feeding and exercise. Sea sickness was one of the worst things to contend with, as neither horses nor mules could vomit. The best thing that they could do in South America was to put the animals on sloppy food two or three days before they went on board. Their bowels were then comparatively loose, and for the first few days at sea nothing but mash and a little water were given. When making for the Equator they were able to take food, and they were started with oats, the quantity being increased until it reached the maximum, with a little bran. As a result the animals were discharged fat and soft. Those connected with the Remount Department were several times complimented on the condition of their animals, but they were not fit to work. Many of the horses, however, were sent to the front within a few hours of their arrival, and everybody had been blamed for the want of condition. Mr. Mason had referred to the feeding of mules in transit. The mule was even a more dainty animal than the horse. If food or water was soiled the mule would rather starve to death than take it. If there was any receptacle in his neighbourhood he would make use of it. He quite agreed with Mr. Bowman as to the importance of disinfecting horse boxes. He had not the least doubt that the absence of this precautionary measure accounted for the periodical serious outbreaks of influenza in this country. Again, he thought that the careless way in which horses were imported into this country was a matter which required attention. With regard to the serious charge made against veterinary surgeons by the writer of the book to which the President had directed attention he should like to read it carefully and reply to it. Anyone who said that the veterinary medical profession did not do good work in South Africa was a liar, or knew nothing about it. (App.) He was glad to hear that Mr. Thompson went to Liverpool and saw those for his regiment off. If that had been generally done there would have been greater success.

About the War Office, they considered that if five per cent. of the horses sent out to South Africa died on the voyage, there had been a good voyage. America had a death rate of 30 per cent. in the horses sent to Cuba. The percentage in the case of the Phillipines was greater. The French Army considered that if they had a loss of 20 per cent. they had done very well. We had in one ship 934, with 12 deaths; in another 1156, with 13 deaths; and in another ship 875, with 11 deaths. I have made a very careful calculation and find that our percentage of deaths was 2·85, showing that there has been something in veterinary surgeons having a certain amount of supervision in the shipment of horses and mules. (App.)

On the motion of Mr. A. W. Mason, and seconded by the President, a very hearty vote of thanks was accorded to the Principal for his able and interesting address.

The V.S. and Public Health in Italy.

The University of Rome has reorganised a long felt want and instituted a diploma of Public Health for veterinary graduates on similar lines to the medical D.P.H. The subjects for the D.V.H. are:—

1. Bacteriology, specially as applied to diagnostic injections, immunisation, and curative means.
2. Contagious Diseases, including practical recognition.
3. "Zootecnia" of meat and milk and products; Hygiene of the Dairy and cowsheds, sale, slaughter, and export of meat producers.
4. Chemistry and microscopy of food products derived from animals.
5. Practical demonstrations on the inspection of live and dead meat producers.
6. Administration of legislative, statistical and police sanitary methods affecting animals.—*La Clinica Vet.*

EXTRACTS AND NOTES

MECHANICAL FORCE IN PARTURITION.

A case of considerable interest to farmers, especially to those who habitually undertake the duties of accoucheur where their own or their neighbours' stock is concerned, and are not easily dismayed by obstacles to birth, was heard recently at St. Columb Petty Sessions, when Mr. G. M. Pomeroy, M.R.C.V.S., of Newlyn East, and Mr. W. N. Gill, farmer, St. Columb Minor, were jointly charged with cruelty to a mare. To deliver her of her foal, chains were put around the dead foal's head, and a horse employed to pull it away.

Inspector Gibson, R.S.P.C.A., deposed that he found the mare with a suppurating wound and very lame on the off-hind leg.

Mr. T. Olver, veterinary surgeon, Truro, said he had never in all his 35 years' practice taken the measures adopted by the defendants.

Mr. A. Marshall, veterinary surgeon, Plymouth, said he had been in practice 20 years, and he had never heard of such a method as this was. Quite unnecessary force was used.

The defence was that, although the means adopted were somewhat primitive and unusual, it was an urgent case, as the mare's life was in great peril. The owner of the mare swore that in a few hours after the delivery the mare, worth £40, was up and feeding. The accused veterinary surgeon said that he had never used a horse and chain before, but he had no blocks, and it was a case of necessity. It was no more cruel than using the blocks. In the end the Bench fined the defendants each a guinea and costs, being of opinion that the defendants were guilty of cruelty, and that the mode adopted was unprofessional.

We expect, as we often get, some peculiar statements by witnesses called in alleged cruelty cases by the R.S.P.C.A., and especially where a veterinary surgeon is involved, but it passes comprehension to understand where the gentleman who had "never heard of such a method" has passed his time. In a similar period to that he has spent in practice, I have seen or heard of at least half-a-score of cases in which this form of traction has been employed, and, while strongly deprecating the practice as crude and dangerous, have never regarded it as legal cruelty when the animal's life was at stake, and the means of manual or mechanical traction were not available. The absence of any knowledge of the method professed by the witness for the prosecution is the more inexplicable as it is repeatedly referred to in the chapters on "the employment of force in dystokia" in Fleming's "Veterinary Obstetrics," which is the text-book on this branch of veterinary surgery. That the practice is referred to in terms of condemnation does not in the least affect the position that such means of extraction have been employed from a very ancient date, and that it is still frequently employed among farmers in the delivery of their stock, especially cows. There are many men who will not under any circumstances employ a veterinary surgeon in parturition cases, either because they fancy themselves equal to anything that may happen, or, to save expense, accept the aid of a neighbour who has a local reputation of being "good at calving cows"; and among these this extremely primitive method of traction is not uncommonly resorted to when, from maternal or fœtal dystokia and an insufficient force of men, manual traction fails to move the fœtus. Now that such a method of extraction has been declared to be legal cruelty, those who resort to it will do well to take heed to the risk to themselves as well as to the animal.

Considering the means for developing the necessary force in cases of dystokia, Fleming says that "the employment of human or manual force in the extraction of the fœtus is that which is generally resorted to at first. But it is not the only force which may be employed, and especially if it is desirable to exercise very powerful traction. It is true that empirics and amateurs have often adopted the barbarous expedient of attaching cords fixed on the fœtus to a horse or ox, and, by making the latter exert its strength, to drag the young creature through the maternal passage. Rainard mentions that in the Camargue, those who have the charge of droves of mares, not having the services of a veterinary surgeon, yoke another mare to the cords they fasten on the fœtus and deliver the parturient animal in this cruel fashion. Being destitute of anatomical knowledge, and not understanding how to adjust a malposition, the fœtus is nearly always extracted dead, and only too frequently the mother perishes. With the object of extricating the fœtus by force when manual traction is not sufficient, the windlass, capstan, cart wheel, and pulleys have been frequently employed, and with great benefit. Many veterinary surgeons consider the employment of machines as barbarous as ox or horse traction."

But there are plenty of cases met with in practice where there is no malposition, and the obstacle to birth is only the small size of the maternal passages, or the large size of the fœtus, or both combined, in which all the manual force locally obtainable, perhaps in the middle of the night, does not suffice to move the fœtus. In such cases mechanical traction, although not enticing at first sight, is an obstetrical means that ought to be employed in the interests of the animal, which must inevitably perish if the fœtus is not extracted. We do not expect a veterinary surgeon to resort to horse traction, since it would be "unprofessional" for him not to provide himself with mechanical appliances, such as obstetric pulleys, or Baron's obstetrical machine; but in their absence, whether it is better to let a mare or cow die than to resort to the only sufficient force available is a question I should have decided differently from the magistrates in the case above mentioned. The defendant vet. was right when he said it was no more cruel than using the blocks, if he meant in the absence of proper mechanical appliances. The horse, like the windlass or the pulley, does not know of any obstacle it cannot overcome, but the machine is slightly more under control, and its force more steadily applied. The great evils of using a horse are that traction can rarely be applied at the proper angle, so as to act in the most favourable way, *i.e.*, in the axis of the pelvis; that its direction cannot be easily modified according to circumstances, and that it cannot be graduated at will. The traction exercised by the horse is applied suddenly and in jerks, and efficient manual force under intelligent direction is much preferable.

PATELEY BRIDGE, in *Farm and Home.*

A Joke in the War Office.

Not often is laughter heard in the solemn office in Pall Mall. But Captain Champion of the 21st Lancers, and brother to Mr. H. H. Champion, the well known Socialist and lecturer, has recently provoked even the staidest official to unwonted merriment. This young officer, who, by the bye, greatly distinguished himself at Omdurman, was sent a few weeks ago on special Remount duty to South Africa, and it is his formal reports home upon his duties which have so gladdened the hearts of the wearied War Office authorities. Captain Champion came to loggerheads with a veterinary surgeon on board the ship. Here is the passage of his report which deals with the unfortunate vet's methods in taking the temperature of the horses:—

"I didn't at first deem my own knowledge of veteri-

nary science sufficient to suspend him, although his methods were those I had not seen practised before. For instance, putting a thermometer in the horse's mouth and leaving it there. This may be the correct way of taking a fevered animal's temperature, but never having seen it done in this manner it caused a certain amount of prejudice in my mind, to say nothing of the fact that the supply of thermometers under such circumstance naturally proved wholly inadequate, the two which had been sent in the medicine chest being speedily consumed by the aforesaid animals. I therefore considered that Mr. ——, though the driver of quite a successful cat and dog practice in ——, was not competent for the treatment of sick horses on board one of H.M. transports.—*M.A.P.*

TUBERCULOSIS CASE AT SWANSEA.

At Swansea Police Court on 9th inst., Mr. T. B. Brown, butcher, of High Street, Swansea, was summoned for having in his custody at the Swansea slaughterhouse a forequarter of beef which was unfit for the food of man; also with obstructing the complainant, Mr. D. Gladstone Davies (the Meat and Veterinary Inspector) in the execution of his duty at the slaughterhouse. Mr. R. A. Wheatley prosecuted, and Mr. Leyson defended. Much interest was taken in the proceedings, the case having been specially discussed by the National Federation of Meat Traders, at their recent conference in Nottingham. A large number of butchers were present from all parts. The only magistrate who sat was Dr. Jabez Thomas, who took the information, and at the outset Mr. Leyson raised the objection that under the Towns Improvements Clauses Act it was necessary for the magistrate who took the information to be also the person who issued the summons. In this case a different magistrate (Mr. Lloyd) issued the summons. The Bench did not, however, uphold this objection.

The Magistrates' Clerk then said he thought he should call attention to Section 9, by which it was laid down that information could only be laid by an inspector of nuisances. In this case information was not so laid, but by an officer called the Meat and Veterinary Inspector.

Mr. Leyson said he was coming to that point, and, with the consent of the prosecution, he would raise it now.

Mr. Wheatley said the Act gave authority to an inspector of nuisances, an officer of health, "or any other person appointed." He further read the resolution appointing Mr. Gladstone Davies, which specifically stated that he was appointed to carry out the provisions of Section 131 of the Towns Clauses Act of 1847.

The Bench decided that, as the information was not laid by an inspector of nuisances, they were unable to try the case, and the summons being bad there was nothing before the Court.

Mr. Wheatley asked the Bench to state a case for the higher Court, and meanwhile to hear the evidence, and this was agreed to. Mr. Wheatley then opened the case. He said on May 15th Mr. Gladstone Davies was at the slaughterhouse, and seeing the offal of a beast hanging up, the lungs of which were studded with tubercular nodules, he made inquiries, and was told it came from a carcase which was marked "T. B. B." He inspected this, and further found tubercular nodules on the pleura. He thereupon stopped the removal of the carcase, and cut down into the flesh to see the glands. These he found were enlarged in size and tuberculous. He told Mr. Brown the right fore-quarter was not fit for food, and asked him to surrender it. Mr. Brown refused, and the inspector consequently seized it. Subsequently he took the glands to the Cardiff laboratory and Mr. Sugden would say that in them he found every evidence of tubercle bacilli. He also took them to London and obtained the opinion of Mr. King, veterinary inspector of the City of London, and of the principal of the Royal Veterinary College.

Witnesses were then ordered out of court, and evidence was called. Mr. D. C. John (Deputy Town Clerk) was called to prove Mr. Gladstone Davies' appointment and the authority to institute the proceedings. The resolution of the Sanitary Committee had been confirmed by the Corporation, but it had not yet been signed in the minutes, as they could not be confirmed till the next meeting.

Mr. Gladstone Davies was then called and bore out Mr. Wheatley's opening statement. The tubercles were confined to two organs in the animal's chest. He denied that actinomycosis had been mistaken for tuberculosis.

Mr. King, Chief Inspector of the City of London, said he had examined certain glands submitted to him by Mr. Gladstone Davies, and found them affected with tuberculosis. His examination was not microscopic. If Dr. Hulcatt, of the Sanitary Institute, had made such an examination and said that it was actinomycosis he would be sure to be right, having regard to what that gentleman examined, but he added he was firmly of opinion that what he examined was tubercular.

Professor M'Fadyean, Principal of the Royal Veterinary College of London, said the specimens he examined all presented typical signs of tubercular growths. There were no evidences of actinomycosis. A microscopic examination bore out his naked eye examination.

Mr Lawrence, manager of the Swansea slaughterhouse, said the animal in question was killed by a man named Thomas Williams, and bore the initials of the defendant as well as of the sender. Whenever he had told Mr. Brown a beast was wrong he had at once surrendered it.

Mr. Sugden. of the Cardiff Laboratory, said Mr. Gladstone Davies took him two of the organs of a beast. He examined them microscopically and found them tuberculous.

Dr. Savage, superintendent of the bacterial department of the Cardiff Laboratory, also spoke to material taken to him by Mr. Davies containing tubercle bacilli. He sought for actinomycosis, and failed to find it.

At this stage the hearing was adjourned. It was resumed on Thursday (before Dr. Jabez Thomas). After further evidence had been taken, the defence raised several points of law, and the magistrate adjourned the case again, in order that he might consider his decision.

Prof. Koch as an Authority.

The North British Agriculturist seems to regard the importance attached to the announcement of Dr. Koch as a case of misplaced hero worship. We quote the following from the current issue:

"In short, Professor Koch affirms that all the most eminent scientists in the veterinary and medical professions other than himself are hopelessly wrong on this question, and that he alone is right. One may well ask whether he himself has established a record for accuracy? According to his most recent contention, his discovery in 1882 of the nature of tubercular disease was only partly correct, for he now asserts that human and bovine tuberculosis are two distinct diseases. His claim that tuberculin was to be a cure for tuberculosis also proved to be a fallacious one. Then he went to South Africa to investigate rinderpest, and in a few weeks' time he discovered a cure for that disease; but that proved as fallacious as his cure for tuberculosis. More recently he went to India to investigate the 'bubonic plague,' and in

a few weeks' time he discovered a cure for that disease also; but that in its turn proved as unreliable as the tuberculin cure for tuberculosis, or the serum inoculation cure for rinderpest. . . . . His fellow scientists in Germany—notably Prof. Virchow, who is, at least, as eminent as Prof. Koch in bacteriological science—are unanimous in repudiating his new doctrine; and the German people are not hesitating to assert that Professor Koch's new views have been "made in Germany" to meet the views of the agrarian party there, and to secure for that party a repeal of the regulations there compelling the use of the tuberculin which he himself invented."

Death of a Man from Glanders.

The Stirlingshire police authorities have for some time been investigating the death of a man from what, as the inquiries have shown, was glanders. The man in question was at first thought by his medical attendant to be suffering from typhoid or enteric fever, but latterly the doctor was forced to the conclusion that there were symptoms of glanders in the case. The man subsequently died, and his medical attendant called in a colleague, who also agreed with him that the man had died from glanders. The medical officer for the county and the police authorities were then communicated with, and, as a result of inquiries made, it was ascertained that the deceased had assisted his son in a carriage-hiring business, and had been attending and treating a horse which was thought to be suffering from a severe cold. A visit was paid by veterinary surgeons to the carriage hirer's premises at which the deceased had been employed, and, after examination of the horses there, it was certified that not only was the horse which deceased had been attending suffering from glanders, but other three horses on the premises were also suffering from the disease. It is a very unusual thing for human beings to be affected with glanders, but there is no doubt that it has taken place in this case.—*N.B.A.*

Personal.

DOLLAR.—On the 27th inst., at 13 Hyde Park Square, the wife of Peter Dollar of a son.

ARMY VETERINARY DEPARTMENT.

From *The London Gazette*:

WAR OFFICE, PALL MALL, July 24.

The King has been graciously pleased to give orders for the following promotions . . . . in recognition of the services of the undermentioned Officers during the recent operations in China. Except where otherwise stated these rewards will bear date of 29th November, 1900:—

* * * *

BREVET.

To be Veterinary-Major:—Veterinary-Captain E. H. Hazelton.

WAR OFFICE, July 30.

I.Y.—Surrey.—F. R. Brandt, gent., to be Vet.-Lieutenant.

C.V.S. N. Molyneux and J. D. Cherry left Cape Town for England on July 24 in ss. "Algeria."

C.V.S. A. H. Sugden left Cape Town for England on July 27th in the transport ss. "Englishman."

CORRESPONDENCE.

TUBERCULOSIS.

Sir,

In following the discussions on the above, and especially Dr. Koch's statement anent the behaviour of the bacillus being innocuous from man to the cow; through practical experience I have formed the opinion that we have a disease to deal with which passes from the cow to man, not recommunicable from man to oxen, but communicable from animals to man, from man to man, and from oxen to oxen.

The explanation of some people not contracting the disease is a common one to germ diseases, viz., the habitat is not suitable, or in other words the conditions of the body are not such as would be a favourable medium for the germ to multiply itself in.

Taking this view of the behaviour of the germ, and there is no doubt that recent investigations sharply point to it, it behoves us to take instant steps for further investigations being made, and more stringent regulations to keep the public from being poisoned with the germ.

I trust you will give as much publicity to this letter as possible, and that others will be induced to discuss the matter further.—I am, yours faithfully,

J. DUNCAN MILLER.

Tolcross, July 31st.

A MONORCHID.

Dear Sir,

I venture to send the following case which may be of interest to your readers.

Subject—Bay country-bred entire, 3 years. Operation—castration. Having removed the left testis, no trace whatever could be found of the other. I had bought the horse a month previously at Meerut Horse Fair, so you can imagine my disgust at being stuck with what we then thought was a Rig. Careful examination of the inguinal ring disclosed no signs of either testis or cord. I ventured to say at the time that it might possibly be a case of having only one testis, but our old *salutri*, an excellent practical man of over 38 year's experience, said in the course of all his practice he had never come across a genuine case of one testis.

It is now three months since the horse was operated on, since which time he has been carefully watched, and given every chance to show himself a rig. I can only say that he has not given the slightest sign of it.

He is extraordinarily quiet, never screams and will stand alongside a horsing mare without looking at her. May I not therefore conclude it is one of those rare cases of a horse born with one testis?

G. H. BADCOCK,
7th Bengal Lancers.

Fyzabad.

THE PERIOD OF INFECTION AFTER PINK-EYE.

A correspondent asks us to publish the following query:—

What space of time must elapse after an attack of pink-eye before an entire horse could be put to service with absolute safety?

"DEPOSUIT."

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED.—Messrs. E. White Wallis, J. D. Miller. Lieut. Badcock. "Deposuit." *The Irish Homestead.*